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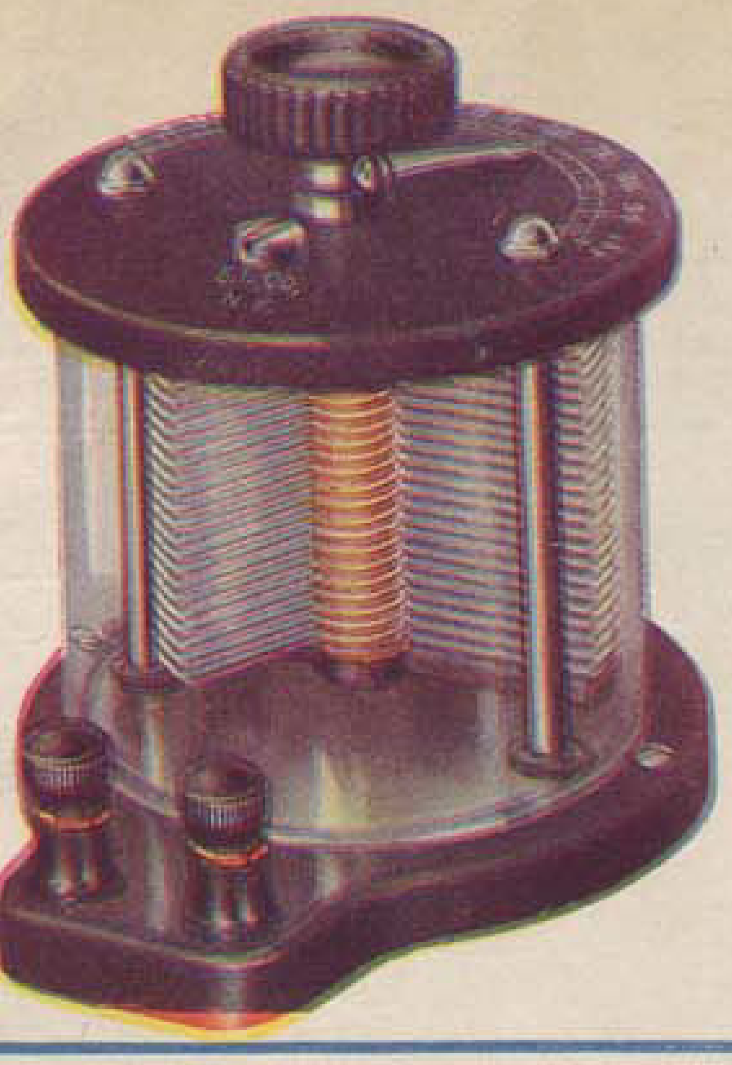

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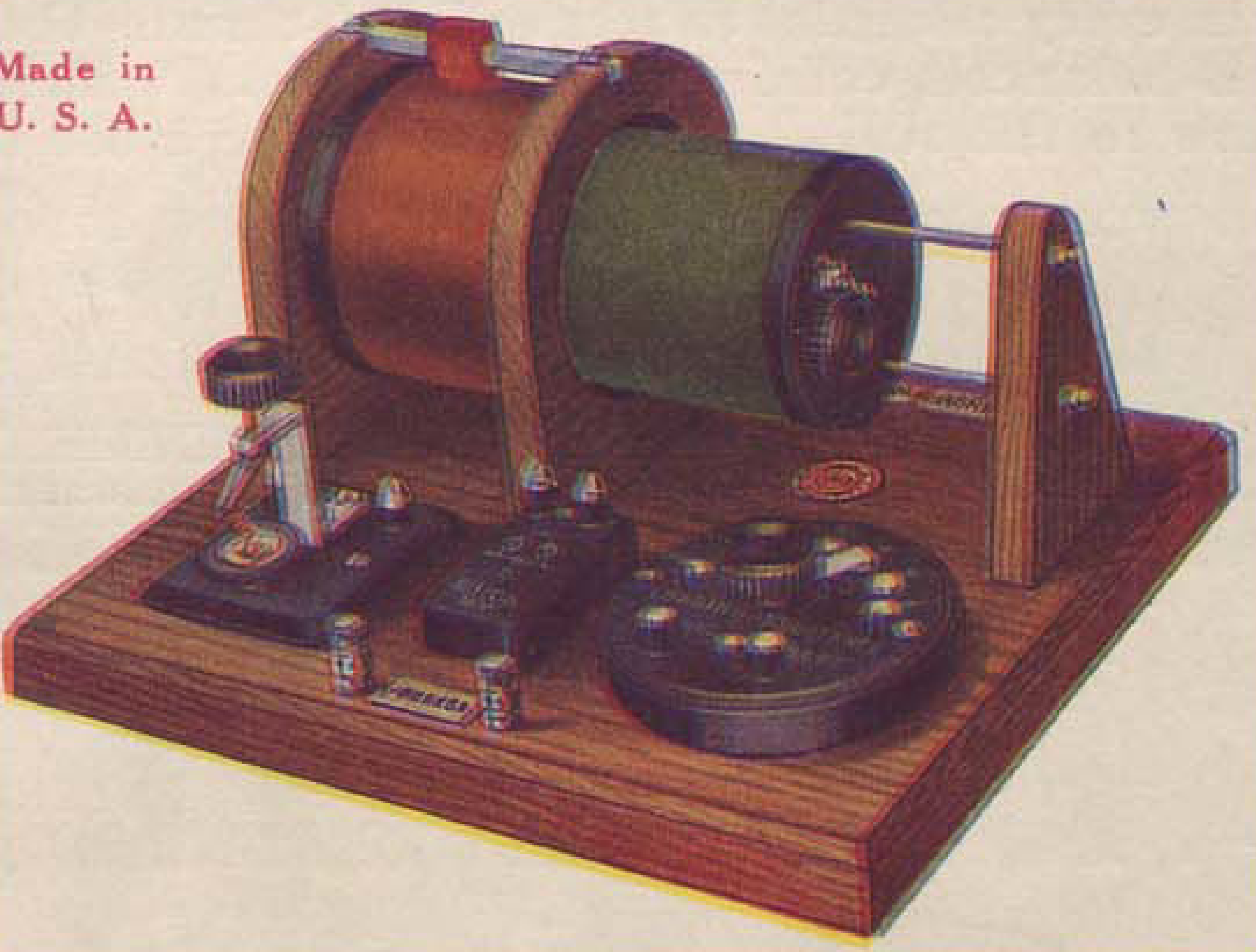

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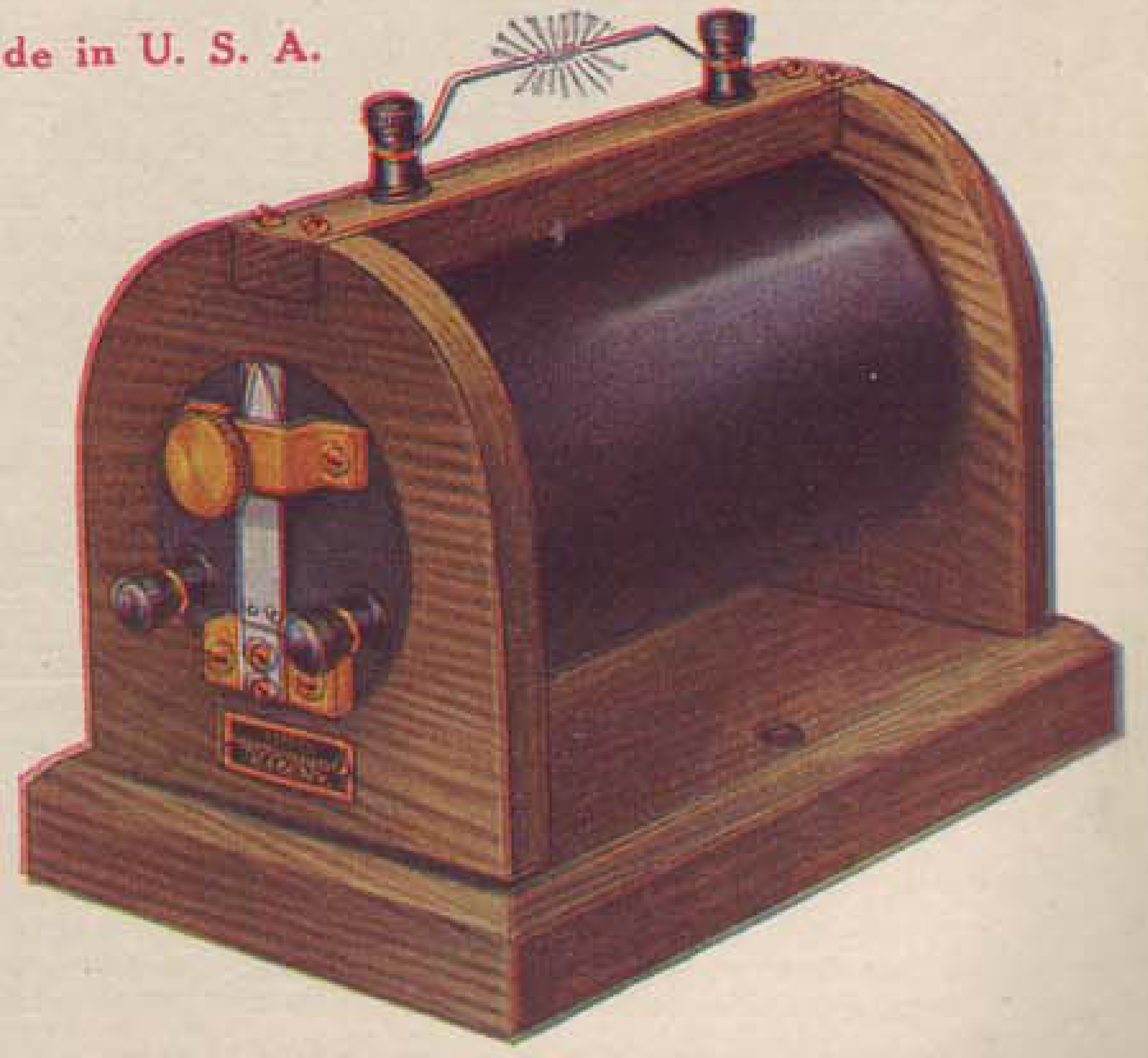

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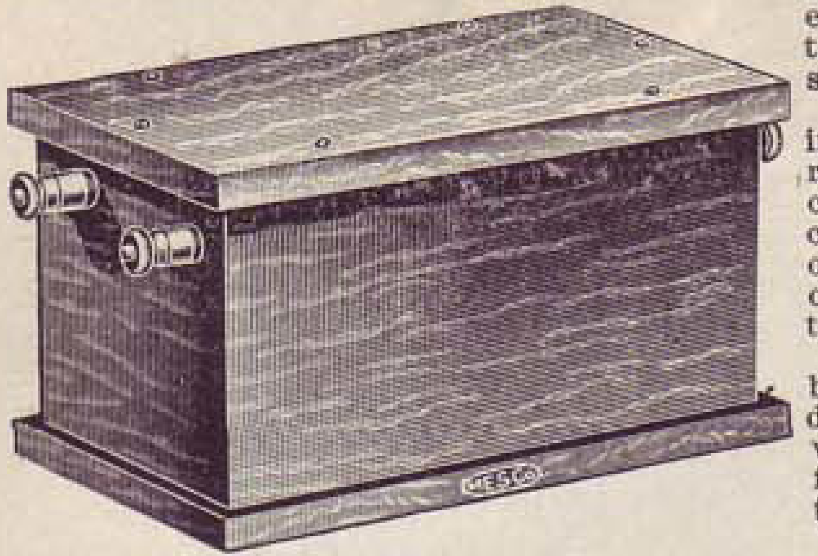

This **Special Transformer** is constructed especially for intensifying in-coming signals.

It can be used for intensifying signals received from any crystal detector by connecting an audion detector on the other side of the transformer winding.

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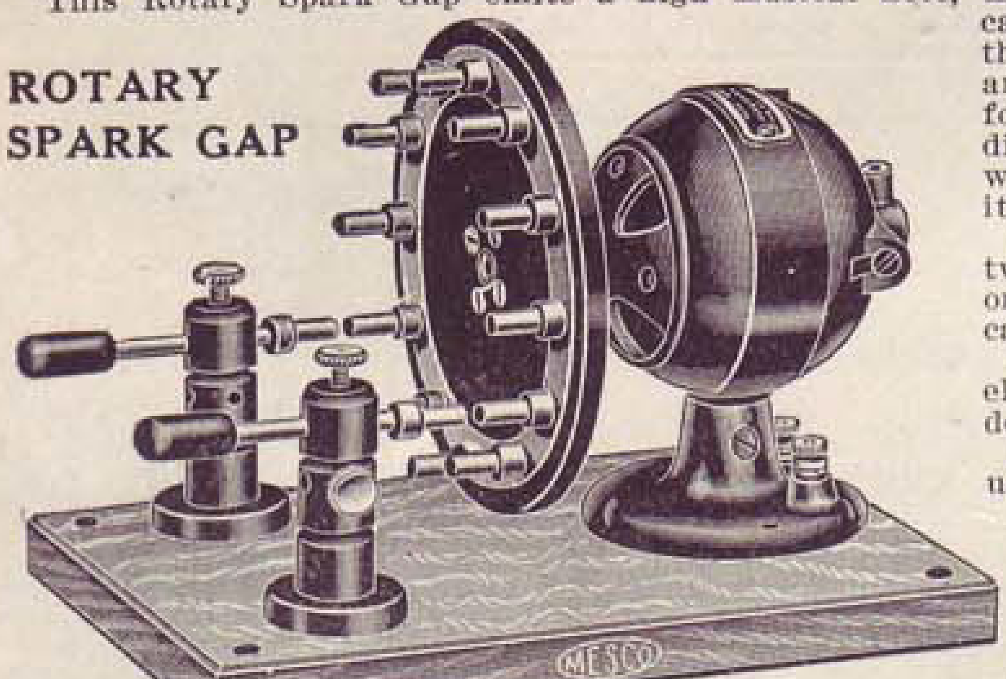

A **Rotary Spark Gap** is required in every transmitting station by the Federal authorities, for the reason that this type of gap produces a pure wave of low damping decrement. It also increases the efficiency of any transmitting station from 20 to 30 per cent.

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The rotating member has twelve sparking points mounted on a hard rubber disk and is carried on the motor shaft.

Also fitted with two stationary electrodes with special adjusting devices.

The Gap can be successfully used on any of our spark coils or transformers up to and including 1 K. W. capacity.

Our standard Globe Motor is used, which will operate on 110 A. C. or D. C. circuits and attains a speed of 4,500 R.P.M. Also made with our Globe Battery Motor, which can be operated on a six-volt circuit.

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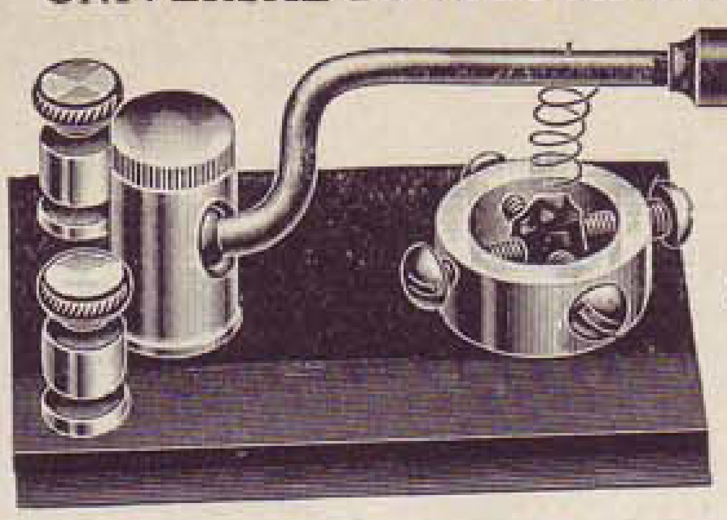

No. 248
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This **Stand** has a heavy brass cup, with four binding screws, capable of holding crystals up to and including ¾ in. diameter.

A hollow standard encloses a brass ball. Through an opening in the wall, a brass arm with hard rubber handle is secured fast to the ball, making a ball and socket joint, allowing it to be adjusted at **any** angle or used in any position.

A hole for the introduction of different size wires extends through the arm. A set screw in the side of the arm binds the wire.

Supplied with two binding posts. All mounted on a heavy genuine hard rubber base 2¼x4¼x⅜ in. All metal parts nickel plated. A spring rests on the ball in the hollow standard and sets into a cup under the adjusting screw, so that varying pressures can be had as circumstances require. Remains permanently in adjustment under jars and vibrations of every description.

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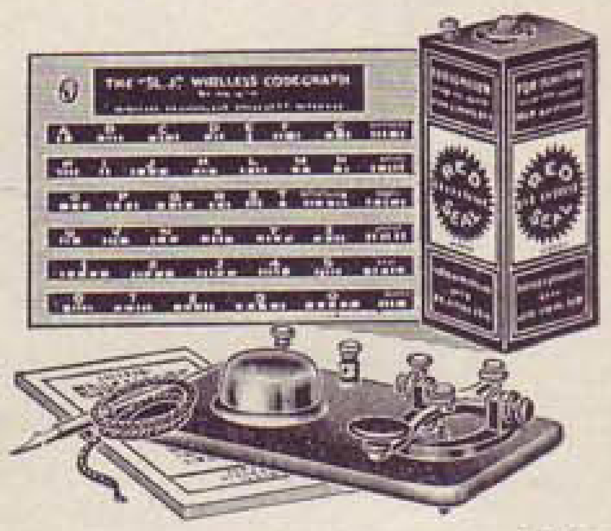

The **Codegraph Plate** is of metal, with insulated dots and dashes. The Pen is connected in circuit with the Red Seal Dry Battery and the Wireless Practice Set. When the pen is drawn across the dots and dashes it closes the circuit and the buzzer sounds. It is possible to attach a sounder to the outfit and get the telegraph click also. A practical and efficient way of learning wireless and telegraph signals.

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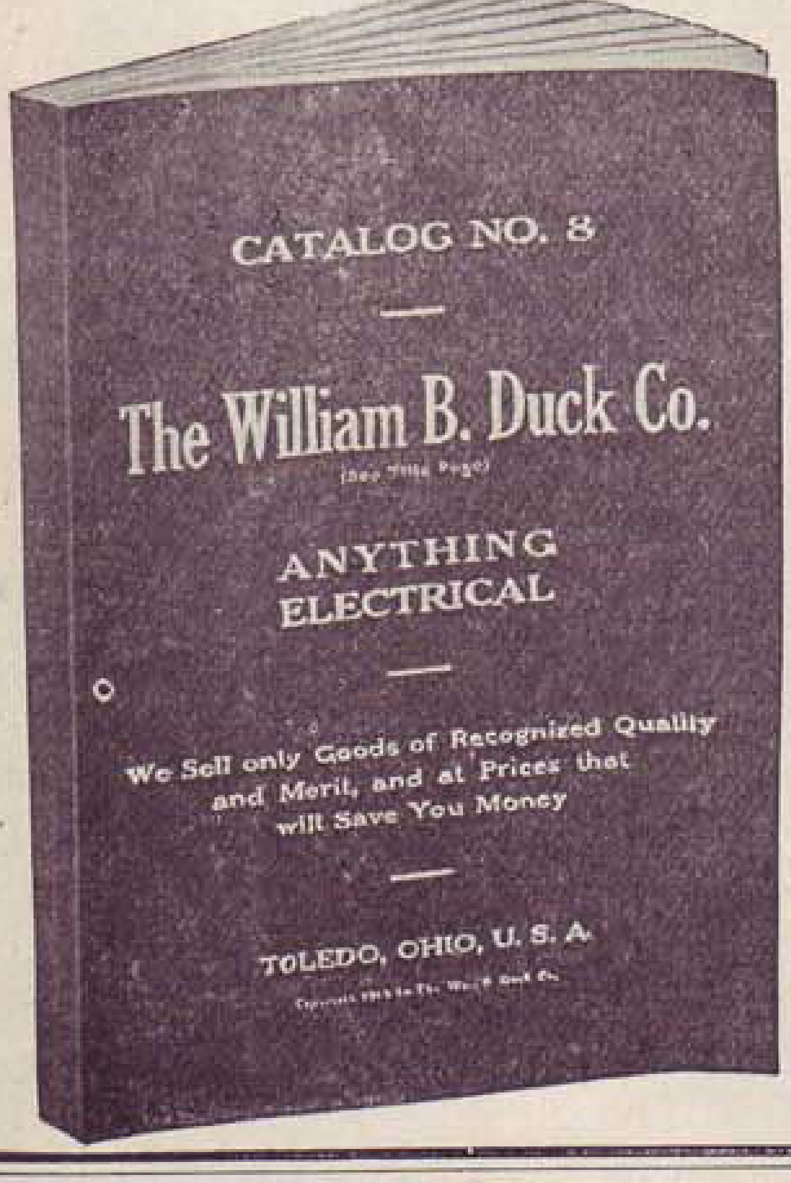
303	Mesco Codegraph Set	$2.50
304	Codegraph Plate, Pen and Book	1.00
342	Practice Set, no Codegraph Plate, Pen or Book	1.50



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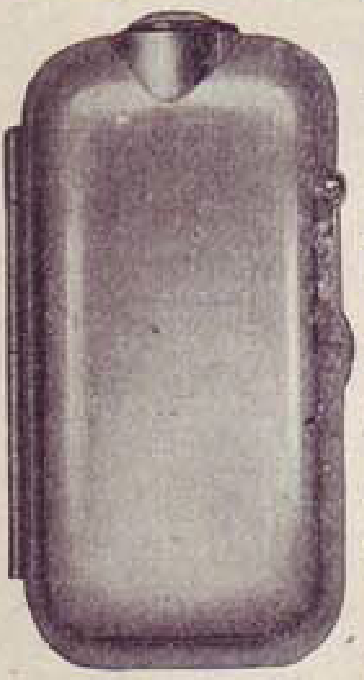

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CHURCH SERVICE BY TELEPHONE.

By E. O. Catford.

In Guernsey, England, if a Sunday happens to be disturbed by the elements, the populace can remain at home by their comfortable hearth and listen to the sermon, the organ and choir instead of tramping through the rain or snow, as the case may be, and then arriving at the church in so irritable and distressed a condition that they can hardly and whole-heartedly participate in the church service.

This is accomplished by having the telephone exchange connect you to the church by a switch. The charge for this service is 10 cents, but public officials, such as police, firemen, militia and others, who are kept from church services by their duties, are given the privilege free of charge.

At Platte Fougère Light-house Station (Guernsey), where these photos were taken, frequently as many as eight persons sit around the table on a Sunday evening, listening to the minister's sermon five miles away.

Two Views of Telephone Installation on Island of Guernsey, England, Whereby Soldiers and Others Can Hear Church Services Five Miles Away in Any Kind of Weather at Cost of 10 Cents. Microphone on Pulpit is Marked at Left.

TESLA SUES MARCONI FOR WIRELESS CONTROL.

Nikola Tesla has appealed to the law to declare that he and not William Marconi is the inventor of wireless telegraphy. Many millions in money and world-wide control of the commercial use of the wireless transmission of energy are involved in the struggle.

The suit has been brought in the United States District Court in the name of the Nikola Tesla Co., of which the Serbian inventor is the president, and to which he has transferred all of his fundamental patent rights in wireless telegraphy. The defendant in the action is the Marconi Wireless Telegraph Co. of America.

Mr. Tesla announced recently in connection with the suit that he has just been granted a patent by the United States Government which will supersede and revolutionize all present forms and applications of wireless telegraphy and will enable him and the financiers who are associated with him to obtain and keep a hold on commercial wireless telegraphy, no matter what may be the outcome of the litigation he has begun against the Marconi interests.

"My earlier experiments in Colorado in 1899," he said, "demonstrated that I was on the right track, and with a transmitter of my invention of not more than 30 inches in diameter I succeeded in concentrating and applying an amount of electrical energy twice as strong as is contained in an ordinary stroke of lightning.

"Since then I have pursued my experiments with that one point in view, namely, the discovery of a way of concentrating and absolutely controlling electrical energy. This result has been attained under the workings of the apparatus for which the Government granted me a patent last December.

"I now claim that I can confine any amount of electrical energy, and that, too, without the use of insulation. The Marconi and other existing systems of wireless telegraphy require that there shall be insulation in connection with the transmitter. I can now send a wireless current entirely across the ocean.

"In transmitting a Marconi wireless current, for example, not more than 20 or 30 horsepower of energy is required; with my new apparatus I can concentrate and direct 5,000 horsepower of electrical energy.

"With this tremendous energy thus concentrated and controlled I can telephone by wireless across the ocean. I can use the apparatus, also, for sending a blaze of light over great distances."

Mr. Tesla in the complaint alleges that he is the inventor of a system of transmission of electrical energy and of apparatus arranged for that method and system, for which he received a patent, numbered 645,576, applied for on Sept. 2, 1897, and issued March 20, 1900, and for which he also received a patent, numbered 649,621, applied for at the same time as the other, and issued by the commissioner on May 15, 1900.

Marconi's application for a patent on wireless telegraphy, the complaint asserts, was filed on Nov. 10, 1900, and was not granted and issued until June 28, 1904, being numbered 763,772.

The Tesla company asks the court to declare the Marconi wireless telegraph patent null and void, claiming that the Marconi patent covers the inventions and combinations of apparatus described and claimed in the Tesla patents.

The Marconi company has put in an answer denying any infringement.

The Tesla company also has begun a suit against the Marconi company for alleged infringement of the Tesla patents.

[Ed. Note.—Tesla's patents and wireless transmission of energy are covered in "Wireless Telegraphy" by Sewall, procurable from our Book Department at $2.15 prepaid.]

CAN ELECTRICITY TRANSFER THOUGHT WAVES?

(*Continued from page* 253.)

in my pocket, what is on it?' Without a moment's hesitation he said 'keno.'"

Mr. H. Gernsback, who has studied considerably such matters as mental telepathy and also such matters as "thought transmission" in so far as the matter can be studied at this time, has made a suggestion which may be mentioned as worthy of trial in this field. This suggestion embodies the use of a set of one or more sensitive Thermo-couples, which, as we know, produce an electric current whenever they are heated. It has been found that invariably whenever the brain is concentrated on some problem, or thought, that heat is produced in such a way that it will cause the forehead of a person to perspire, even though slightly. Now if this Thermo-couple arrangement is placed against the forehead there is a possibility that waves might be picked up and transmitted over a wire to a proper receiving apparatus or instrument attached to the head of a second person.

A theory promulgated by Mr. H. W. Secor takes for its basis a somewhat different phenomena. This particular action is nothing more nor less than the *Aurora*, which we know exists for quite an appreciable distance about the human body. Some time ago a well-known English scientist and investigator made it possible *to view* these vari-colored *aurorae* surrounding the human body by utilizing specially devised screens, and when looking through these screens the ever-changing aurora about the body could be very clearly observed. Moreover, and in line with Mr. Secor's theory, these aurorae are of different colors or hues for different conditions of the mind or brain in the person under observation. They are red, or reddish yellow, when the person is in great anger, and thus they change through variours colors for different emotions. If the inductance coils of Dr. Bell, and proposed by him to be strapped around the head, will work at all, it seems very likely that they would act by means of these aurorae discharge from the body and which quite possibly is electrical in its nature. If this is so then a simple coil at both transmitter and receiver end of the line should suffice, as the variation in the electrical *aurorae* set-up about the body and controlled by the brain would then induce corresponding ever-changing currents in the first coil to be transmitted over the line to the second coil. This coil could then, in virtue of the fluctuating currents passing through it from the line, influence the *auroral field* about the body of the second person on whose head the coil was placed.

It has been pointed out by several electrical men, and particularly by Dr. Giuseppe Musso, the well-known consulting electrical engineer of New York City, that quite possibly the points at which to apply these transmitting and receiving coils, or other forms of apparatus, is not about the head at all, but at some other vulnerable point or points on the body which would have to be found by experiment, and also in consideration of the fact that these more vulnerable points have the strongest effect on the control of the electric charge on the body. He also has said that in thought transference it has been invariably noted that best results are obtained between two persons having a strong affection for each other, which in another sense might be considered as two minds "in tune" or syntony.

Are you a regular reader? It will pay you to become one!

Electric Spark Pictures

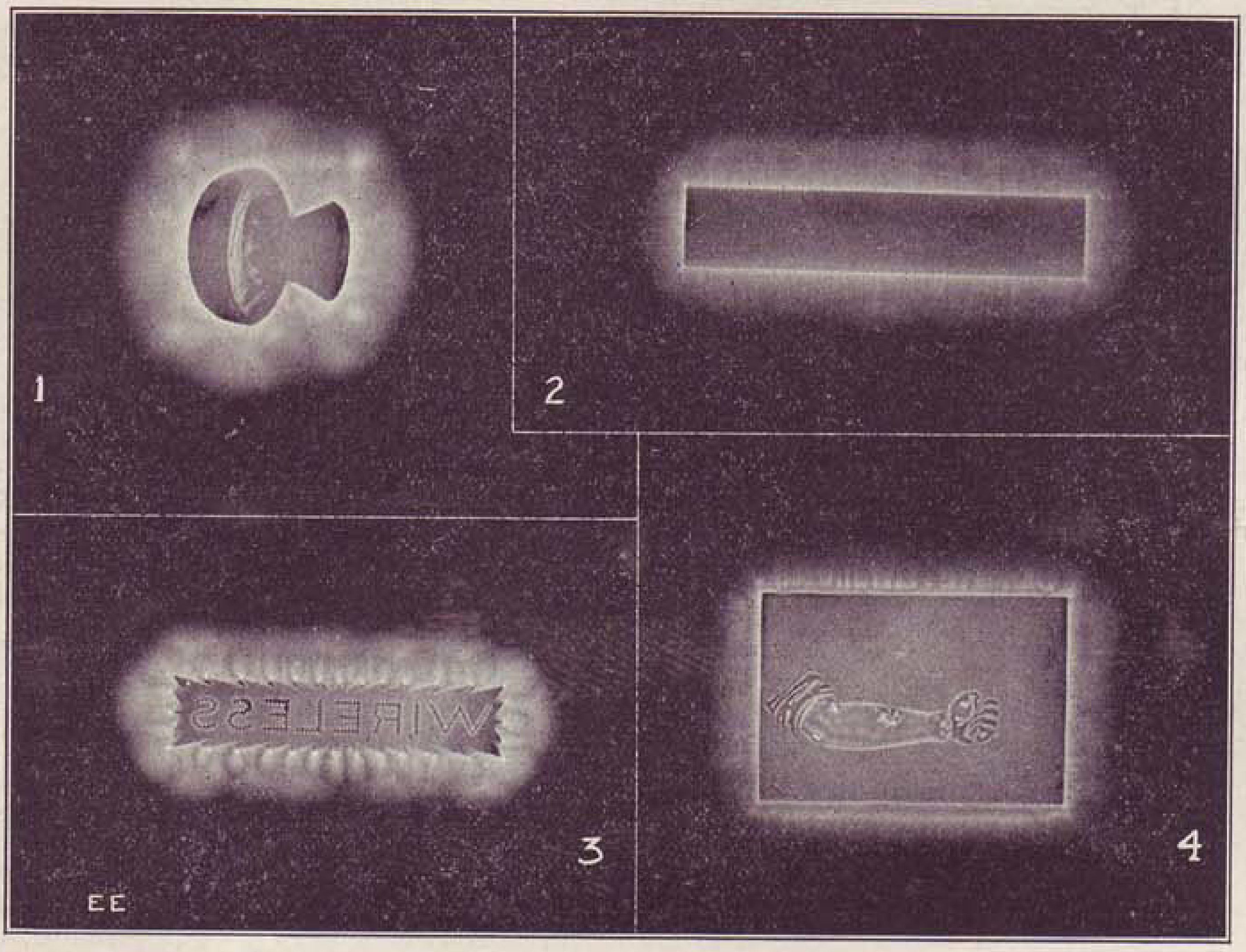
THE illustrations herewith present some new ideas on electric spark pictures.

While electric spark pictures, of course, have been taken right along, our illustrations present some modifications, and in order to show our readers how these pictures are made, a short treatise on the subject will not be amiss. An ordinary spark picture is taken as follows:

Any spark coil from one quarter-inch up to three inches with a fast vibrator should be used. Connect one lead of the secondary terminal to a piece of tin foil or to a piece of sheet metal or metallic plate which should be level. Directly on top of this, with the gelatine side upwards, place an ordinary photographic glass plate. It goes without saying that this operation must be carried on in red light, or else the photographic plate will be spoiled. It is also necessary to carefully blind with black cloth the vibrator of the spark coil so the white spark will not cast light upon the plate.

When everything is ready, take the metallic object which is to be printed by electricity and place it face down directly on top of the photographic plate, so it is in contact with the sensitized gelatine. If the object is square or round without any relief on its face, the negative when developed will show a gray square or a gray round spot. If, however, an object with a relief such as a coin or similar metal object is used, and the plate is developed, subsequently, it will show faithfully all the details which the original article has.

When making spark pictures it should be remembered that a short spark only should be made, and should under no circumstances last longer than a second. Just starting the vibrator for a fraction of a second will usually give best results. Pictures taken with more than two seconds duration usually come out too black.



Some Out of the Ordinary Spark Pictures. (1) Made from Electrotype of Microphone, (2) Steel Rule, (3) Electrotype of "Wireless," (4) Zinc Line Cut of Arm and Hand.

The philosophy of spark pictures is as follows:

When a spark is made the electrical current passes between the object and the metallic plate underneath the photographic plate, the three acting like a condenser.

Wherever the metal touches the plate upon developing the negative will show a black spot at that point. When the negative is printed on paper this process is, of course, reversed, and whatever is black on the plate will be white on the paper and vice versa.

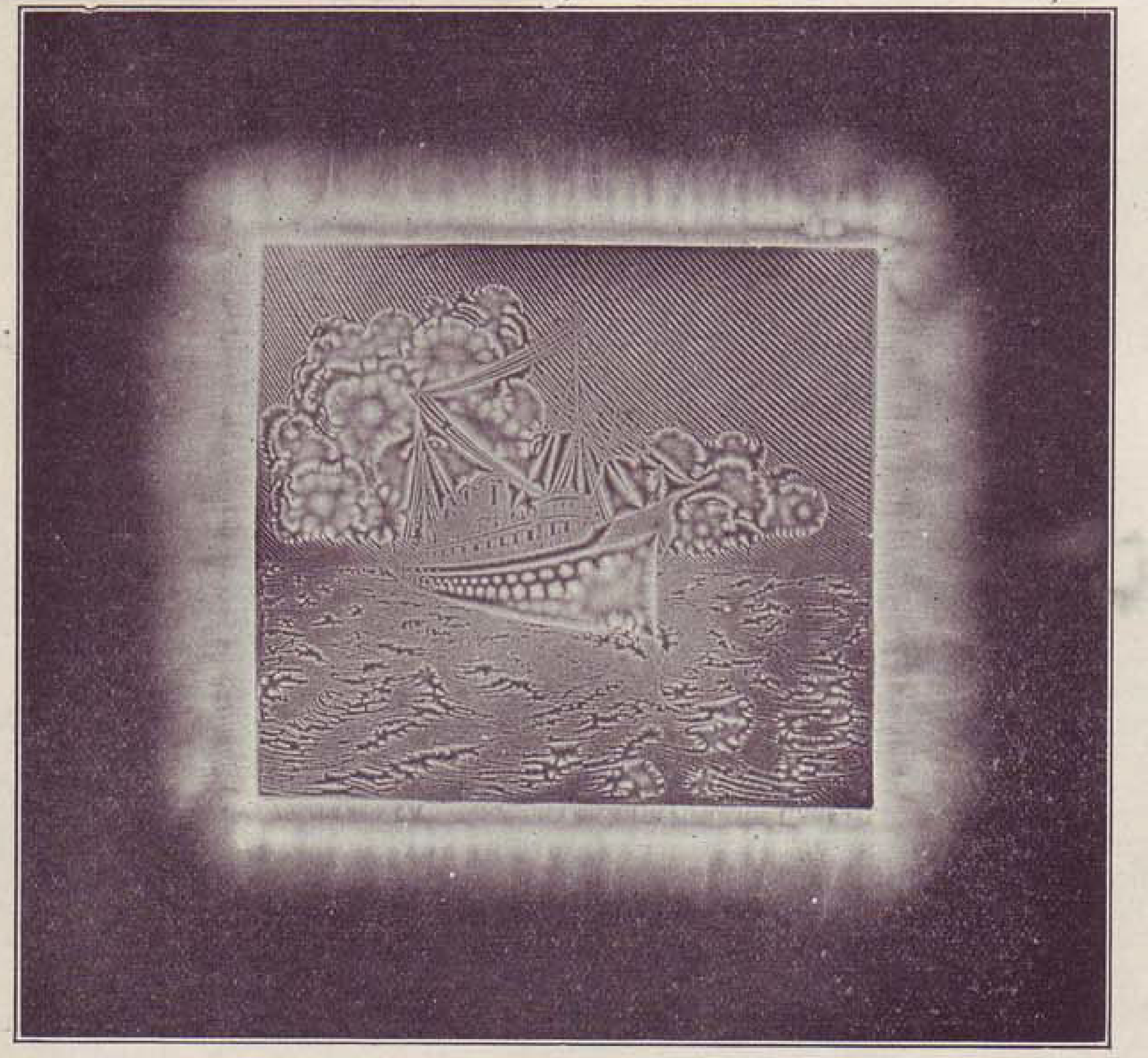
The pictures as shown in this article were taken by H. Gernsback, and the following explanation is given. Up to this time no pictures were known to have been taken of common electrotypes or zinc cuts such as are used for printing purposes, and it occurred to Mr. Gernsback that good results might be obtained if such plates were used. The illustrations show the result.

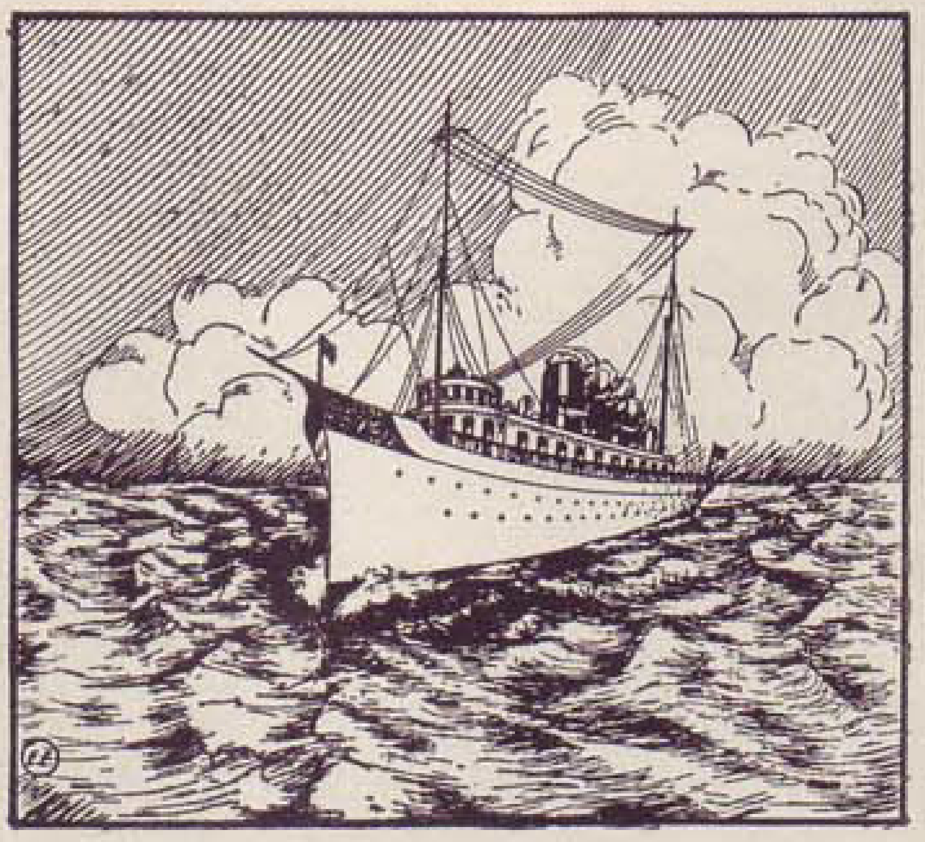
Fig. 1 shows an ordinary line cut, copper electrotype of a microphone which was placed face down upon the plate. The result is clearly shown.

In Fig. 2 an ordinary three-inch steel ruler was used, and in the original photograph all the details down to the division of 1/64 of an inch were clearly shown. These details and also the details of the other three photographs have been lost in the half-tone process by making the plate for printing the illustrations in this magazine.

Fig. 3 shows another copper electrotype with the word "wireless" on it.

Fig. 4 shows an ordinary zinc cut illustration. This cut originally illustrated an article on page 66, June issue of this magazine. It shows much clearer in the orig-





Above: Original Zinc (Line Cut) from Which Spark Picture at Left Was Made.

At Left: Beautiful Spark Photo Made from Zinc Cut Shown at Right. Note Port Holes "Illuminated" by Spark Effect.

inal print. As will be seen, everything is reversed, i.e., white is black and black is white.

The aurorae which show around the illustrations are simply stray sparks during the time the spark was made.

Fig. 5 shows a unique spark picture made with the above process, and this also was a zinc cut, and was originally used in the *Electrical Experimenter,* page 52, June issue. We reproduce the original cut so it may be compared with the spark picture. It will be noted that a curious effect is produced, and attention is called to the port holes which seem lighted up, whereas in the original they only show as points. The explanation is that these sharp points when they made contact with the plate blackened the latter at those points, and when the print was made they, of course, appeared in white. It will be seen that the electrical spark reproduces every detail of the picture down to the most minute detail.

Half-tone cuts were tried but without obtaining results for the reason that the multitude of points which make printing possible were too fine and too near together and the resulting picture therefore appeared simply as a blur.

NEW TALKING MACHINE UTILIZES COMPRESSED AIR AMPLIFIER.

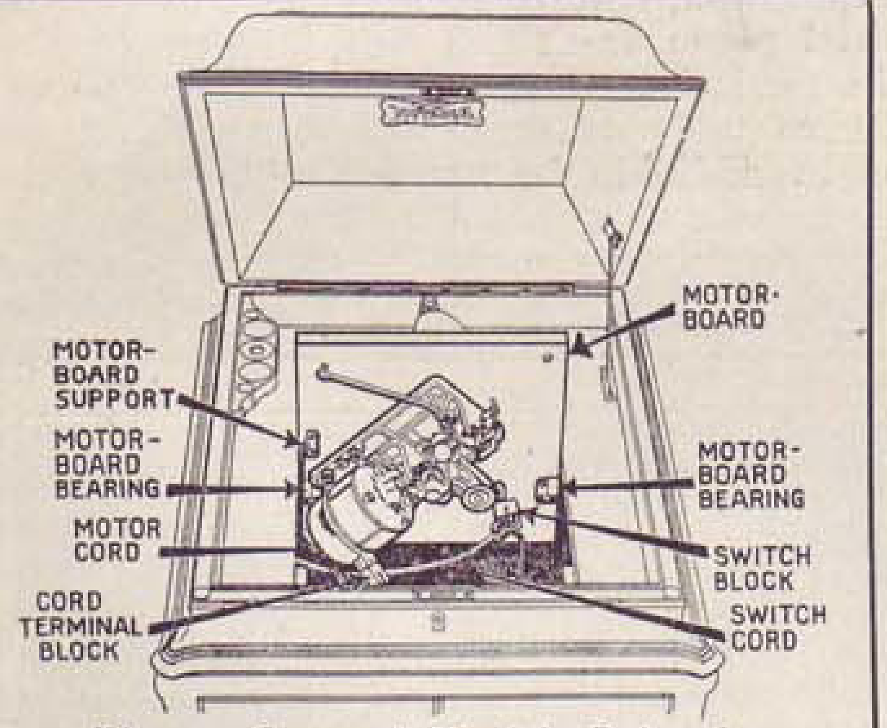


Fig. 2. Compact Electric Drive for Victrolas.

A new talking machine, which is known as the "Auxetophone" and constituting one of the well-known "Victor" line, is shown in our illustration herewith at Fig. 1.

As at present supplied, the Auxetophone constitutes an amplifying phonograph. It utilizes regular disc records, the same as any talking machine of the "Victor" type, and the sounds as given forth from the records and through the regular stylus needle on the phonograph arm are caused to *interact* on a special air valve hooked up with a compressed air tank, as illustration shows.

A compressed-air blower is driven by an electric motor, as perceived, and the machine is equipped either for direct or alternating current, as the service may require.

The motor is directly connected to the blower, which furnishes air for the pneumatic sound-box, in which the volume of the sound is augmented or amplified. An oil condenser is mounted on top of the blower, as shown, which is connected by a flexible tube to an air-pressure equalizing tank. A flexible tube connects to the top of the tank and leads to a filter. From the filter another tube leads off to the taper-arm equipment, which includes the taper tube leading to the horn. The tube is finally connected to a pneumatic sound-box.

The turntable of the machine, which holds the disc records, is in the present style operated by a spring motor; but of course it is readily fitted with an electric motor drive.

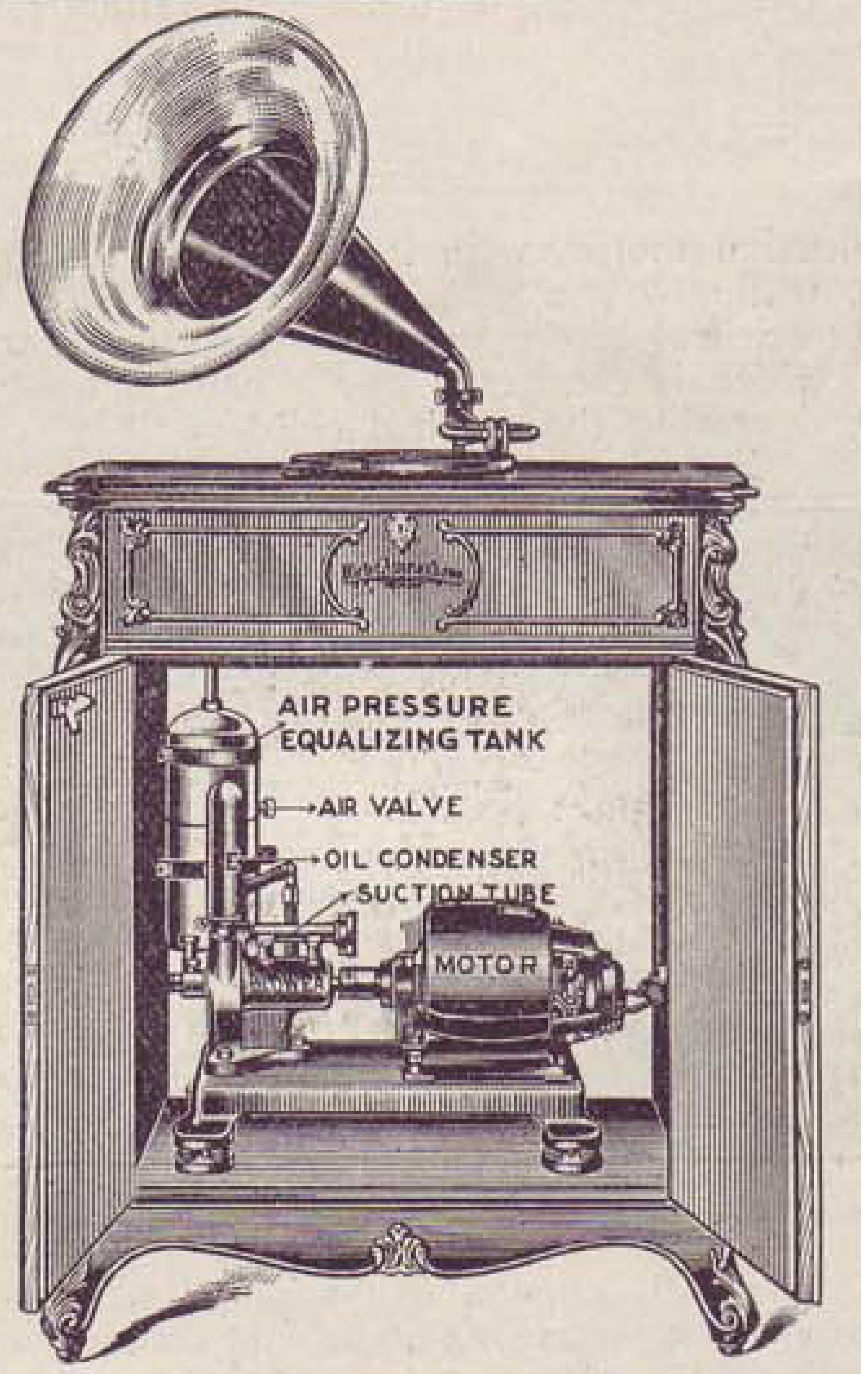


Fig. 1. New Talking Machine with Compressed Air Amplifier.

The second illustration shows the latest model Victrola, equipped with electric motor drive. This machine has no connection with the one aforementioned, known as the Auxetophone. A very neat and readily accessible method of mounting the electric motor drive for the standard Victrola is observed from the sketch, Fig. 2. The top table-board, containing the record holder or turntable, etc., swings on pivots, as observed, so that the motor and its speed governor, etc., become at once accessible for repairs, oiling and other attention by simply pushing a button.

NEW TELEPHONE SET FOR AVIATORS.

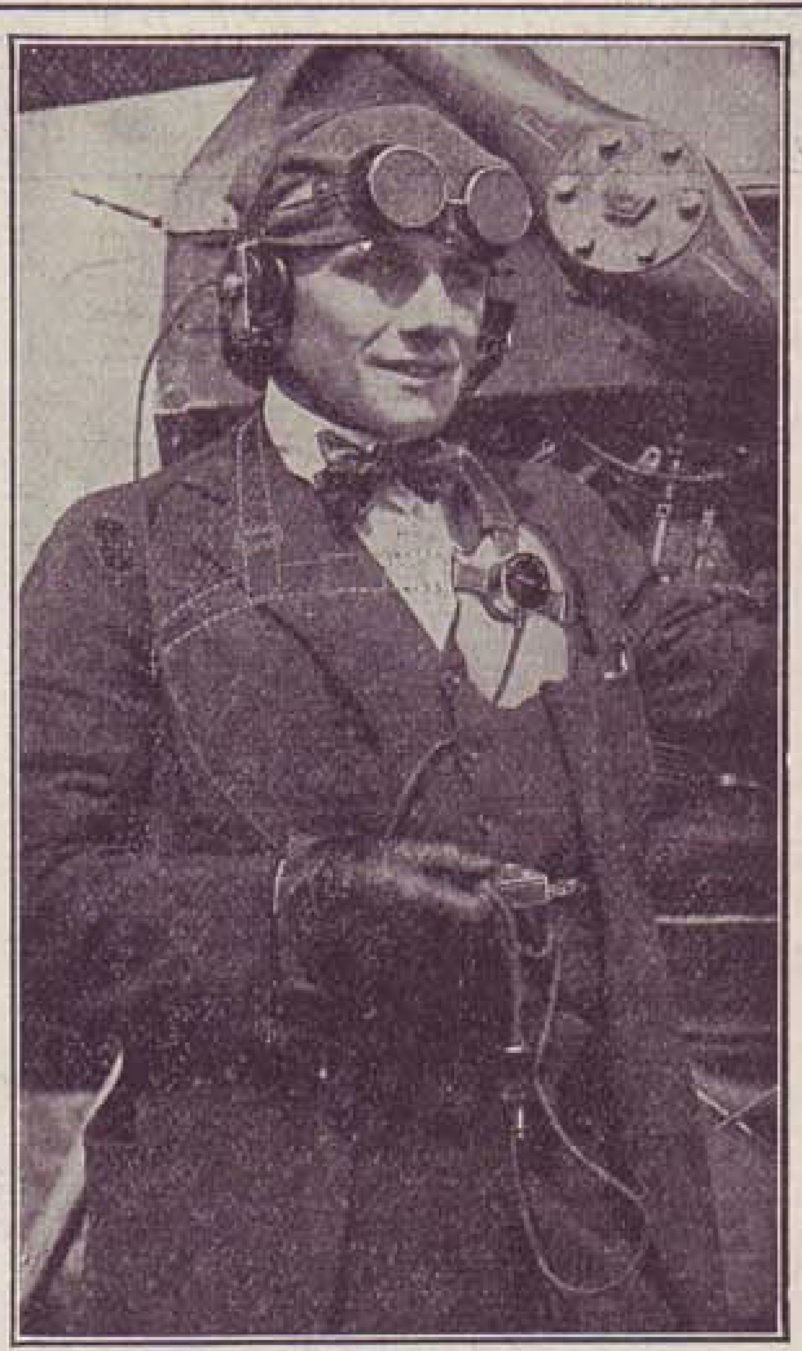
Our two illustrations herewith show a new style telephone set, known as the "Aero-Phone," and particularly designed and intended for the use of aviators. Its express purpose is to permit the aviator and his mechanician or passenger to talk to each other freely without being in any way interfered with, due to the excessive noise of the engine, etc.

The Aero-Phone in Use.

These aero-phone sets utilize a regular head-band, specially made and carrying two compact type watch case receivers, as observed. These receivers are held against are ears by the spring head band, so that practically all of the extraneous disturbing noises are thoroughly excluded. The spring tension, however, is so arranged that the entire outfit is not in any way uncomfortable for the wearer of the phone. Special microphone transmitters are provided with soft rubber caps on each, strapped to the chest at a point below the collar bone and above the third rib.

In speaking the chest muscles transmit the voice vibrations to the transmitter, thus enabling telephone conversation to be carried on comfortably between the two occupants of the aeroplane. The microphone is thus not placed before the mouth.

The telephone receivers and transmitters are connected by flexible cords, which terminate in a small plug. When the aviator or passenger takes a seat the plug is inserted in a jack mounted on the framework of the aeroplane. The only battery current required is that furnished by three regular dry cells, which will provide continuous service for 100 hours without any appreciable loss of transmission quality.



Aviator with Aero-Phone, Talking Through His Chest.

This perfected telephone set for aeroplane use is of great interest, particularly for military aeronautical applications.

BRONX RADIO CLUB.

The club is composed of 11 enthusiastic members, most of whom have stations of their own. Those wishing to further their knowledge of the subject are instructed by the more advanced members.

Officers are as follows: M. Haber, president; H. Berlin, vice-president; L. Brodie, secretary; A. Richter, treasurer; J. Smith, business manager.

Communications from other clubs and individuals should be addressed to L. Brodie, secretary, 1382 Boston Road, Bronx, New York.

A very unique scheme said to be practical is illustrated in the diagram, Fig. 5. Here the selenium cell is brought into play, which, as is well known, changes its electrical resistance in direct proportion to the strength or amount of light thrown on it. In this manner a relay is operated with a selenium cell and battery in series. If the relay be adjusted so it does not close its local circuit with the selenium cell in the dark, then, when the cell is exposed to light, its resistance falls from 1/4 to 1/6 or more of its dark resistance, and the relay deriving more current from the battery will close.

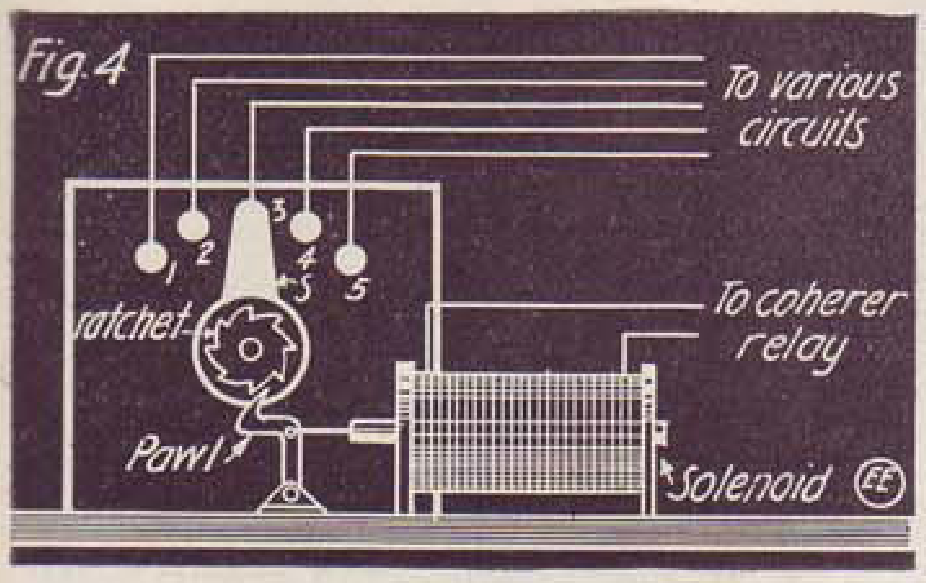


Fig. 4. "Step by Step" Radio Control Relay.

The complete theory of Fig. 5, however, goes further than this and takes into consideration the latest discoveries in the art, which made known the fact that under certain physical conditions selenium will perform its function best as above explained when a certain *colored light*, corresponding to a definite etheric vibration frequency, is projected against it. With this in mind, a working arrangement possible is hypothecated at Fig. 5, where a powerful searchlight A is caused to project various colored beams of light on to the parabolic reflector R.F. In the focus of this reflector are grouped the battery of selenium cells 1-2-3-4, etc. Each cell operates a distinct relay, as did the coherers in Fig. 3. If a red light is thrown on the selenium cell, then a "red-sensitive" cell responds, causing the device carrying it to act accordingly.

This new science is undoubtedly only in its infancy, and at the toddling age at that, so that the wireless fiend will find plenty to keep him busy in this useful branch of the wireless art.

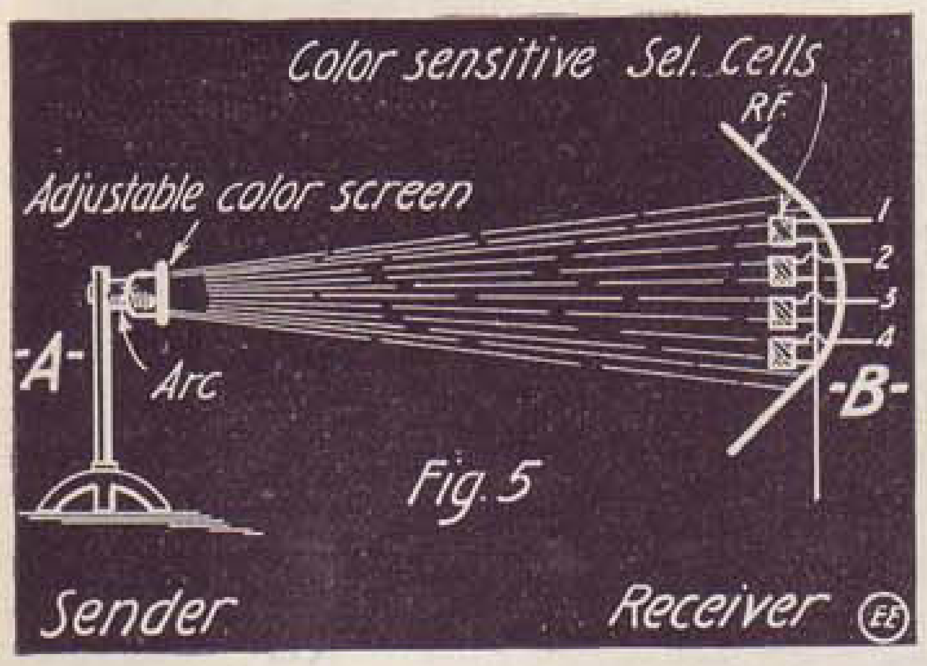


Fig. 5. Using the Selenium Cell for Wireless Control.

MEMBERS OF RADIO CLUB TO PREPARE FOR COMMERCIAL LICENSES.

A course of lectures and instruction will be given to the members of the Connecticut Valley Radio Club beginning with its next meeting, and after finishing the course the members are expected to be prepared to take the examinations in Boston for first-grade commercial licenses. The future meetings, which will begin the season in wireless telegraphy, will be featured by wireless telegraphy apparatus loaned by the various manufacturers.

Efficiency in the Amateur Radio Station

By Thomas W. Benson

EFFICIENCY in wireless telegraphy resolves itself in getting the longest range and the loudest signal obtainable with the apparatus in use. Of course good design is necessary, but the object of these paragraphs is to point out the best methods of utilizing instruments that are really unfitted for radio work.

For instance, take the amateur who possesses an X-Ray coil. It gives a long thin spark, ideal for the purpose for which it was designed, but in the average set its efficiency is very low, due to the fact that most articles describing the use of coils for radio telegraphy take it for granted that the proper coil is employed, and deal with the standard apparatus in connection with it.

A coil of this description when connected, as shown in the usual hook-ups, gives a long wave or else a highly damped wave. The first is the result of the enormous amount of capacity used to shorten up the spark gap. A short gap is necessary if the decrement is to be kept low, as the spark gap is a form of resistance which affects the decrement. On the other hand, if a small condenser is used to keep within the 200-meter limit, an extra long gap is necessary and a broad, highly damped wave is emitted. The latter evil is the less noticeable because the Government stations will pick up and observe a long wave, paying little or no attention to the badly tuned wave if under 200 meters.

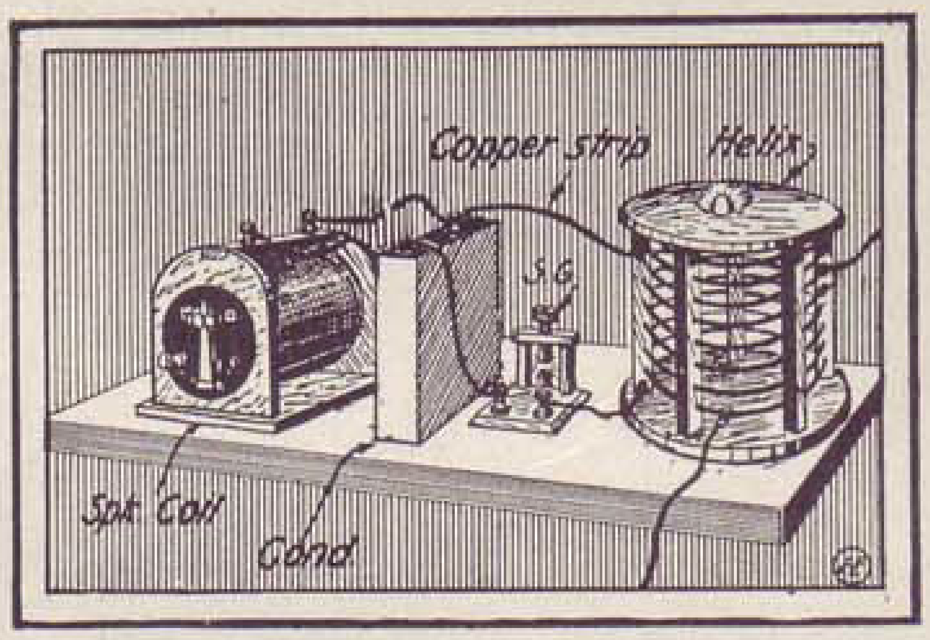


Fig. 2-A. Compact Arrangement of Wireless Sending Set on Shelf.

The proper method of employing an X-Ray coil for wireless telegraphy is sketched in Fig. 1. Here the coil is used without condensers, the aerial itself acting as the capacity, while a lumped inductance, I, is connected in the aerial lead. The gap used is of the compressed air type where the spark occurs in air at a pressure of two or three atmospheres. The exact design of the gap is left to the reader, but one that can be easily constructed is shown.

The container is an ordinary Mason fruit jar, one-quart capacity. The standards are mounted on a piece of hard rubber and the pressure is created by a hand bulb acting through a check valve. Soft rubber gaskets are used to render the whole air-tight.

This method gives a sharp wave of good carrying power and with a very small gap it may be used with coils under one-inch spark length, whereas the helix cannot be employed very well.

Another point overlooked in amateur wireless stations is the relation between interrupter speed and the high tension condenser. The usual practise in determining the proper condenser is to build one with as many plates as the constructor happens to have. If this condenser stands the discharge of a two-inch coil, it is a two-inch coil condenser. If someone else finds that a three-inch coil does not puncture it, it then becomes a three-inch coil condenser, and so on indefinitely.

It is also true that from time to time tables appear in the various journals, stating the number of plates to use with the different size coils. These tables are very good, invaluable in fact when followed out properly, but many amateurs make a serious mistake in trying to obtain a very high pitch note with these condensers. They have, in most cases, speeded their interrupters up to the limit; when, of course, these condensers have been adapted for use with a medium speed interrupter. Therefore, it is necessary to adjust the voltage and speed of the interrupter for best results or efficiency.

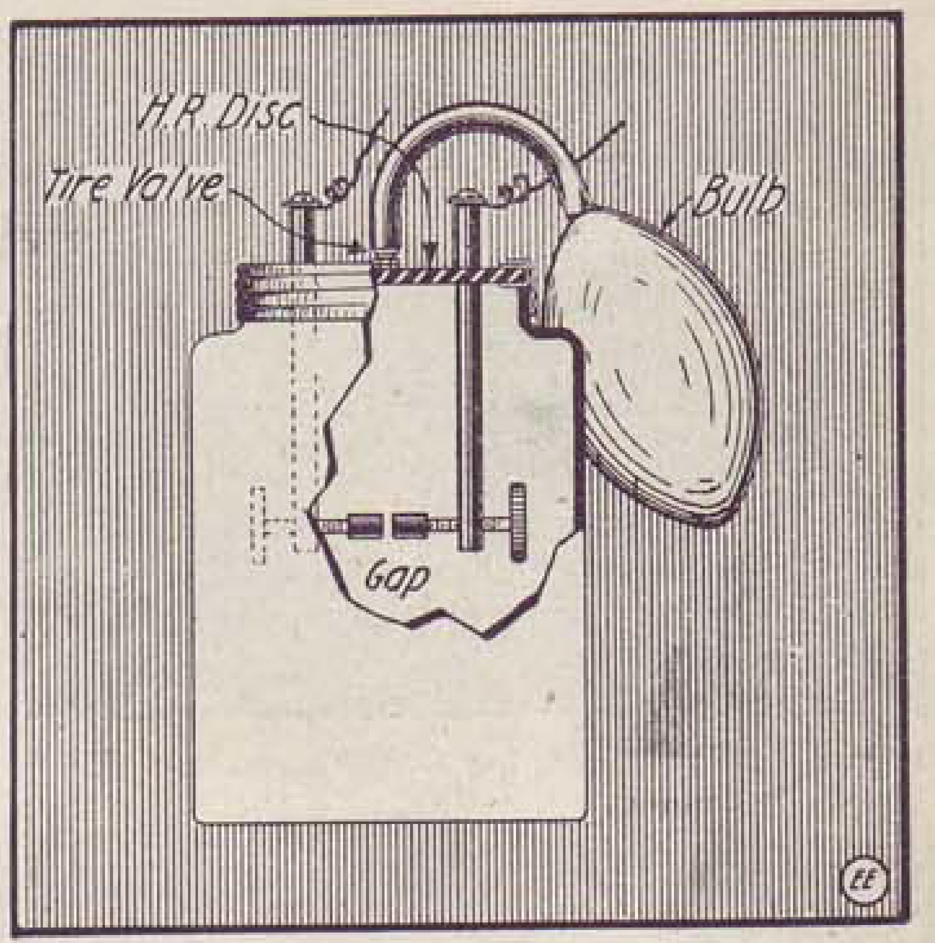


Fig. 2. Home-made Compressed Air Spark Gap.

I will not deal with spark gaps here, as they have been well covered in the past, but one thing necessary is to keep them cool by radiating wings, air blast or dampened sponges, and let me suggest that a vertical gap be used instead of a horizontal in straight gap sets. In rotary and quenched gaps this is not so important.

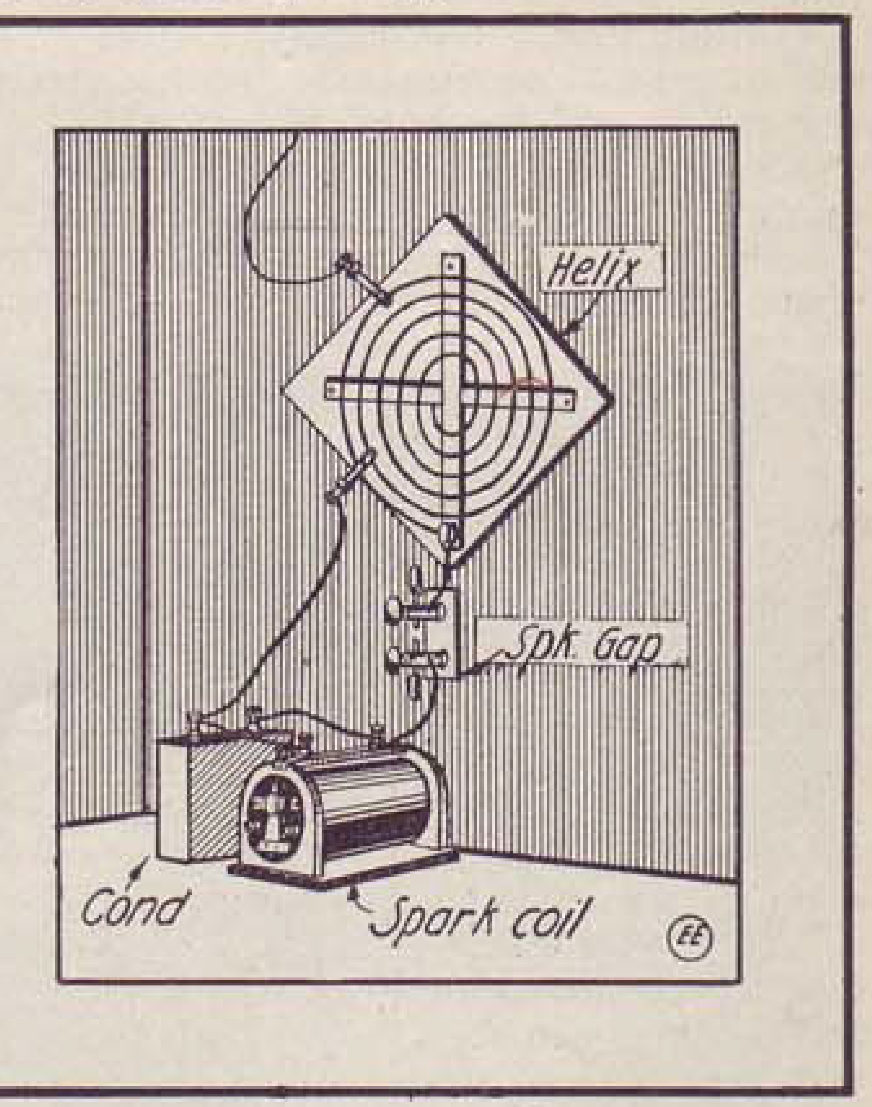


Fig. 2-B. Short Wiring Possible for Radio Set on Table and Wall.

I have also noticed a number of articles on synchronized rotaries to be used with spark coils. A much better way is to use the interrupter end of the device and use a quenched gap instead of the rotary. Less noise and more satisfactory results are obtained. Efficiency again!

By all means keep the leads as short as

possible, both on the sending and receiving sets. Arrange the instruments in proper order. If your sending set is on a shelf, Fig. 2, "A" offers a suggestion for short wiring; if on a table and the gap and helix are fastened to the wall, the second sketch, "B," will be found of service. Use copper strip for the sending set connections, not "bell wire"!

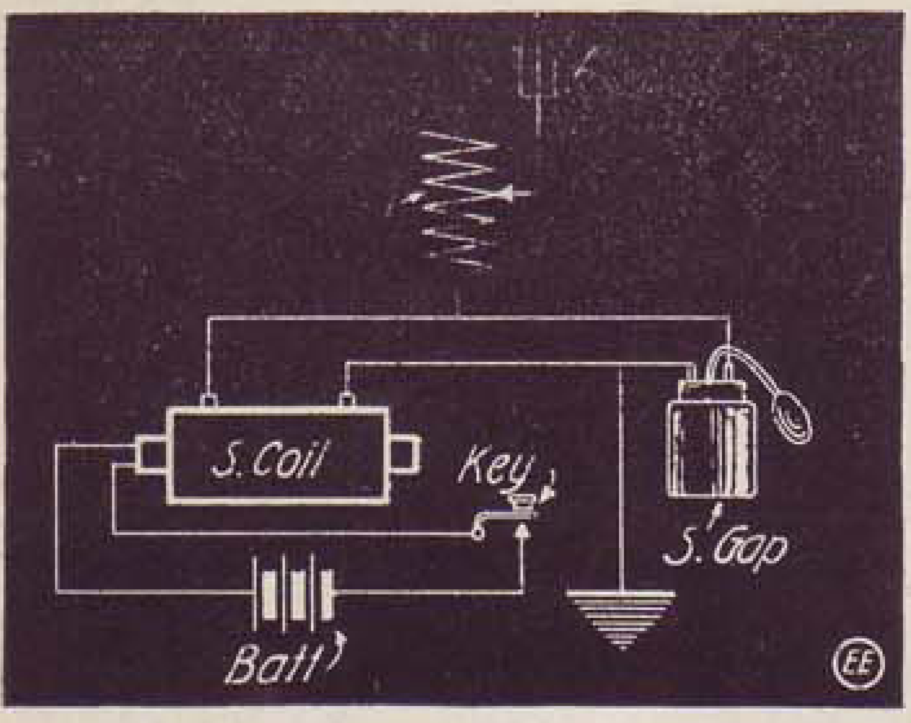


Fig. 1. Connections for Compressed Air Spark Gap.

The aerial switch is another energy-wasting device. It puzzles me why amateurs persist in using a switch, which requires the best of insulation and is always more or less bulky, when a small switch properly connected is much better, or even a telephone key may be used. In Fig. 3 a hook-up is shown that has the usual aerial switch beat for several reasons. The first is that leakage does not affect the results, thus making it cheaper and easier to construct. Secondly, it enables a symmetrical wiring diagram to be used. The aerial enters at top of window, runs to helix, then to switch and thus to ground. An easier, better method is impossible. The hook-up, using a telephone key, is also added. This may be mounted on a table and the change-over can be made in an instant with the small finger. Who wants to use those big switches now?

Turning to the receiving set, most losses are incurred in dead ends, poor contacts, detectors and *poor* condensers.

To overcome dead ends, use fixed inductances and use variables for tuning. The primary of the coupler should have about 40 turns of No. 24 S.C.C. copper wire and the secondary 60 turns of No. 28 S.C.C. The tubes may be 4 inches and 3½ inches in diameter, respectively. The variables, of a good commercial make, as compared with home-made variables (which are nothing more than make-shifts nine times out of ten), should be connected on parallel with the windings. Wave lengths up to 300 meters may be tuned on this coupler; the exact length depending, of course, on the length of the aerial. To receive longer waves a second coupler should be constructed, using 200 to 250 turns on the primary and secondary, respectively. A switch is arranged so as to throw from one coupler to the other, and the fear of "dead ends" is removed. The above construction does away with sliders and switches, thus lessening chances of poor contacts.

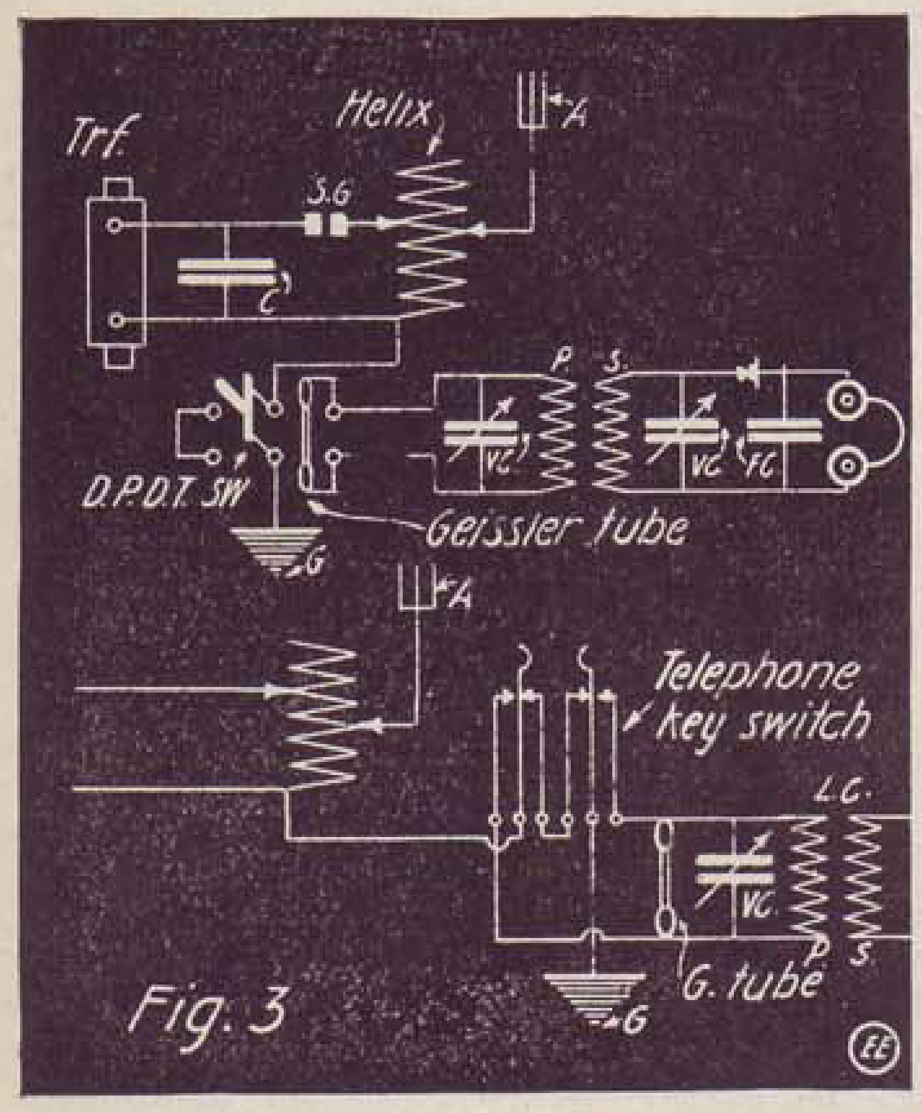


Fig. 3. Simplified Transmitting and Receiving Radio Hook-ups.

The detector is a trouble maker and many devices have been produced to obliterate this. Galena is the favorite and a stand for this excellent detector should be selected that is sturdy, simple and provided with fine adjustments.

All condensers should have an air dielectric, even the blocking condenser. A good blocking condenser may be made from 70 sheets of aluminum, 4x5 inches, mounted in a case and separated from each other by strips of mica at each end. This condenser should be adjustable by a suitable switch. This is another factor for obtaining loud signals, which is often overlooked, as nearly every set of receivers requires a different capacity. The reason for this has puzzled many, but still the fact remains. However, it may be more clearly understood when the 'phones and blocking condenser are considered as an oscillatory circuit tuned to a certain harmonic of the secondary circuit. As a general rule, the higher the resistance the smaller can be the blocking condenser capacity.

In closing, I would say, run parallel wires as far apart as possible; cross all wires at right angles and solder each and every joint.

An Almost Human Wireless Receiving Set

An automatic receiving outfit, an "almost human radio receptor," was the title given to his latest device by Mr. Walter Goodchild, the well-known inventor of the "Permanent Wireless Detector" and other scientific apparatus.

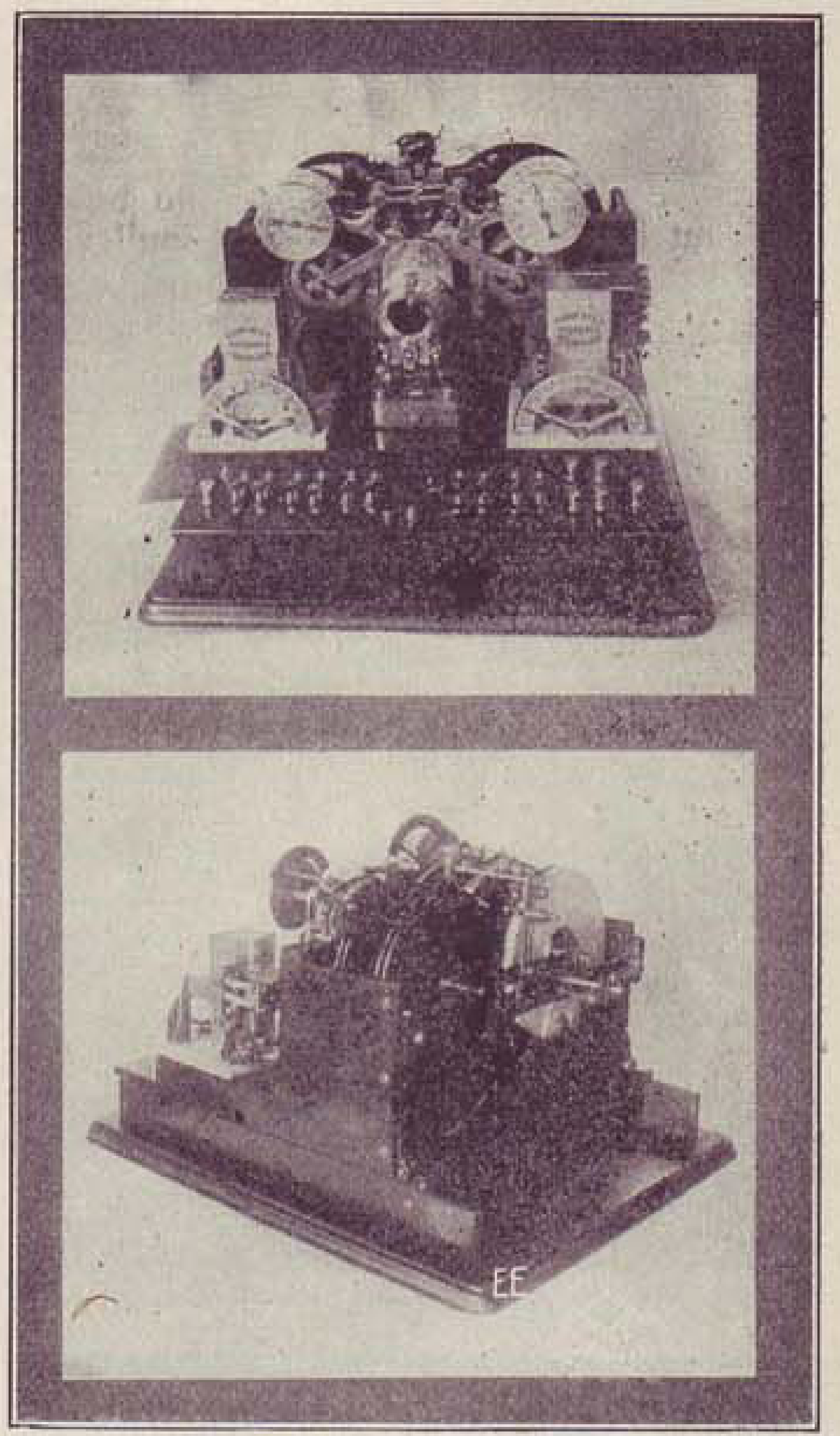
This receiving set is operated entirely by an electric motor, as depicted in the center of the illustration at Fig. 1. This motor operates the various mechanisms by pressing any of the control "keys," portrayed on the front panel, each of which performs a certain distinct function.

The complete machine comprises a specially designed inductive coupler, which consists of four reels containing a copper ribbon, one side of which is coated with a special flexible insulating compound. These reels are wound and unwound as required by the motor. Two sets of coils, one pair of primaries and one pair of secondaries, are provided, as Fig 2 shows. The inductive value between the primary and secondary is changed by moving the secondary back and forth parallel with the primary; this is accomplished by the same motor, operated by a different key. A scale and needle indicates this inductive value, as seen in the upper part of the instrument at Fig. 1. The dial indicator moves according to the position of the secondary coils. The dials on each side of the machine denote the *wave lengths in meters,* corresponding to the position and amount of ribbon in use on the coils.

Two specially designed variable condensers, placed on each side of the apparatus, are illustrated in Fig. 1. These are driven by two separate electric motors, also operated by control "keys" located on the right hand corner of the instrument. The condensers are of the variable plate type, i. e., instead of varying the dielectric as in the ordinary variable condenser; the number of plates in use are actually connected and disconnected electrically by changing the position of the plates. This is accomplished by the motors and in this way the condensers are absolute and reliable in their work. Here the proper dials depict the *capacity of the condensers* in the regular units.

The detector is of the permanent type and is located inside of the case, as also the batteries for driving the motors. The central switch is used to vary the current supplied to the detector.

The operation of this remarkable set is very simple, requiring merely a pressure on the right "key," and watching at the same time the dial indicators to see that the proper wave length is tuned for. It has been found in testing it out that it takes only 11 seconds to change the wave lengths from 200 to 8,000 meters. The set can easily be carried about, as it is very compactly built, adapting it for use on aeroplanes, battleships, automobiles, etc., as the keyboard can be located in any place desired.



Front and Back Views of Improved Radio Receiving Set That is Almost Human in Its Working. Fig. 1, Above; Fig. 2, Below.

WIRELESS SAVED GERMANY MANY MILLIONS.

"War has been declared on England. Make as quickly as you can for a neutral port."

This message, flashed for a radius of 2,000 miles over the system of world-girdling German wireless telegraph stations at 5 p. m. on Aug. 4, 1914, saved Germany the bulk of her merchant marine, according to Godfrey Isaacs managing director of Marconi's Wireless Telegraph Co., London, England, at a meeting of the company.

The saving of the Hamburg-American liner "Vaterland" alone, he added, more than balanced the $10,000,000 Germany had expended in erecting the stations.

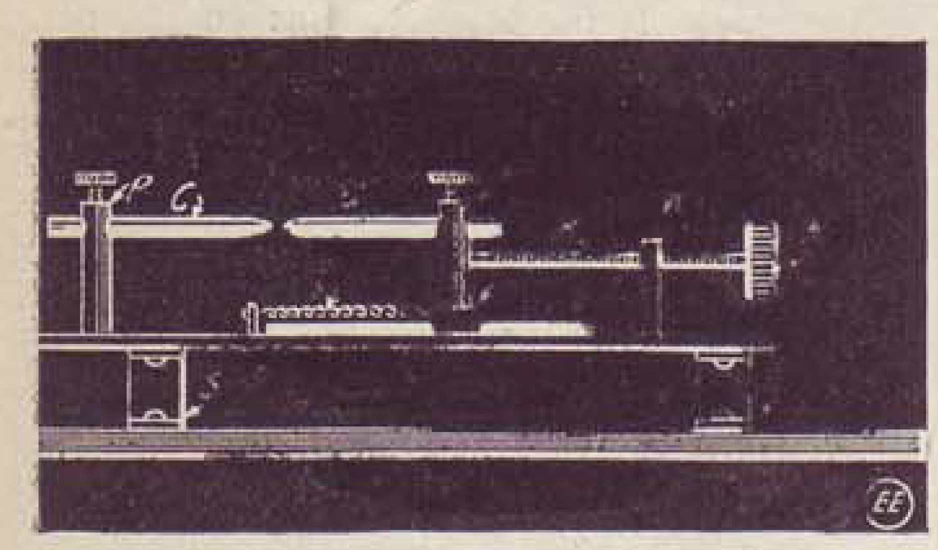
This department will award the following monthly prizes: FIRST PRIZE, $3.00; SECOND PRIZE, $2.00; THIRD PRIZE, $1.00.

The idea of this department is to accomplish new things with old apparatus or old material, and for the most useful, practical and original idea submitted to the Editors of this department, a monthly series of prizes will be awarded. For the best ideas submitted a prize of $3.00 will be given; for the second best idea a $2.00 prize, and for the third best a prize of $1.00. The article need not be very elaborate, and rough sketches are sufficient. We will make the mechanical drawings.

FIRST PRIZE $3.00.

SIMPLE ARC LAMP.

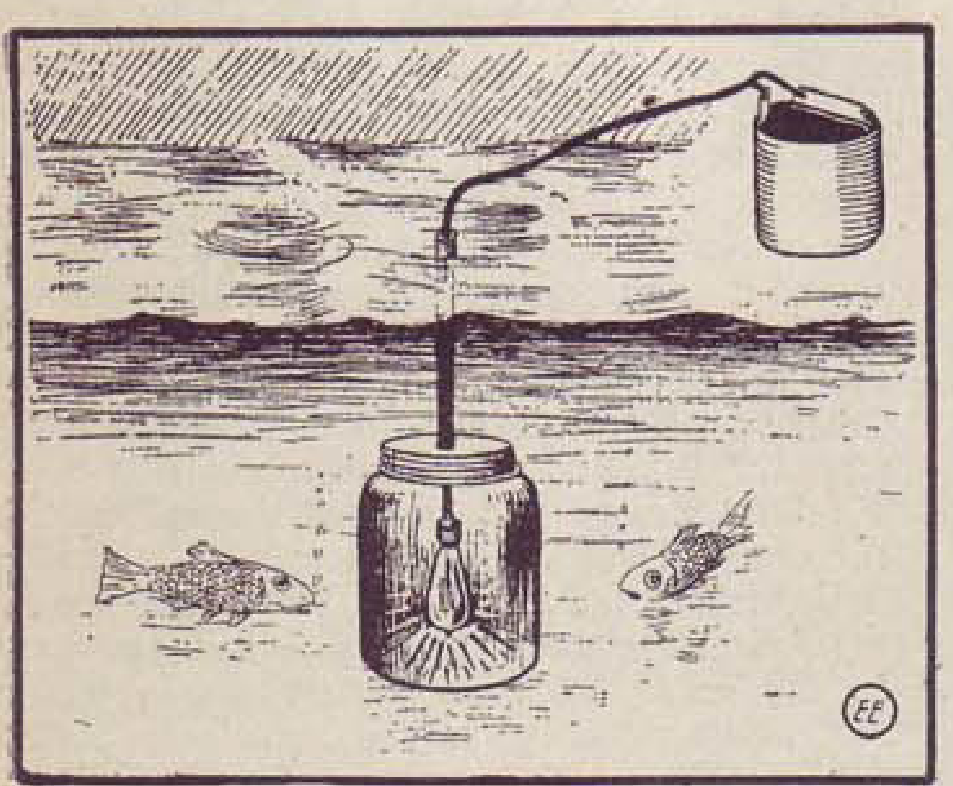
A simple hand-feed for arc lamps is given below. At C C are the carbons. P P′ are standards. I have large ones so as to hold large carbons. S S are brass supports, which I use to hold base above table J. S′ is a spring used to hold back P′, which is soldered in detector cup D, which slides in a brass slide about 3½ inches long. B is 4 inches of threaded brass rod which screws through support W, which has a threaded hole in it. K is a typewriter knob. The base is 11 by 3 inches and is of wood or slate. The wire to carry the current can be fastened in same place as the carbons are, or can be held by separate binding posts placed on the base. I hope that this contribution will be of some use to the readers of *The Electrical Experimenter*. Contributed by EDWARD RHOADES.



Efficient Hand-feed Arc Lamp.

AN ELECTRIC LURE FOR FISH.

Every good fisherman knows that a light will attract fish. A simple light can be made by taking a pint fruit jar, cutting a ¼-in. hole in the top of the cover, inserting a piece of gas pipe in the hole and soldering it to the cover. Insulated wires are run through the pipe, and a small electric globe is attached to the ends in the jar. The other ends of the wires are attached to a pocket battery. The jar is placed under water and the light turned on, which attracts the fish.



Luring Fish by Electric Lamp in Bottle.

SECOND PRIZE $2.00.

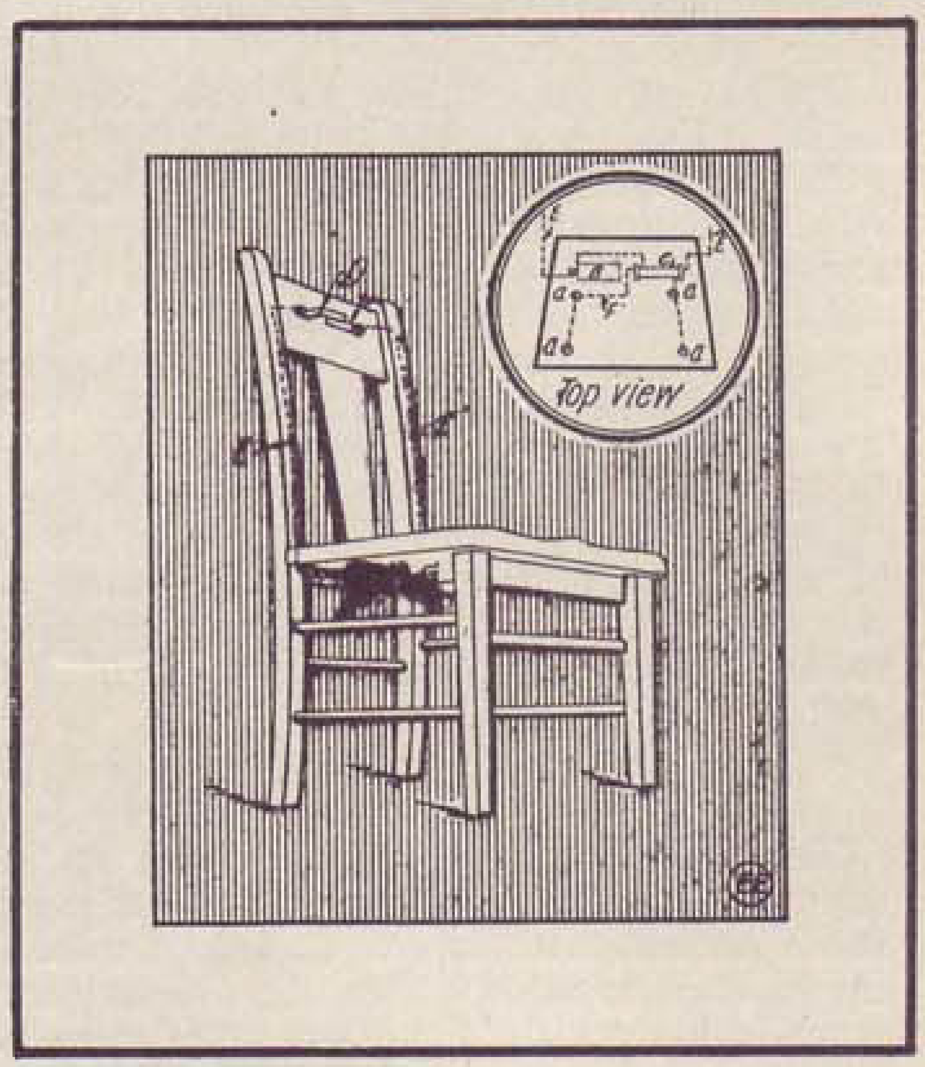
AN ELECTRIC "GOAT" FOR LODGES.

I give herewith a sketch of an electrically charged chair, and below, a brief outline of method of setting up same.

This chair will afford unlimited amusement in your office and probably rid it of a few chair warmers, and for lodge "initiations" it is the boss stunt.

Drive four small wire brads (a) into the under side of chair seat, letting just the points appear on the upper side of seat. With a fine nail set drive them back so that they remain just below the surface.

Fasten a small induction coil (c), and a battery (b) under the seat, soldering the secondary wires (f) to the ends of the brads (a). The parts of the switch (d) can be made from small strips of brass or copper, and screwed to the back of chair, as shown. The switch can be covered up by fake upholstery, etc.



An Electric "Goat" Chair for Lodges.

Run the wires (e) down the back of chair to coil and battery, keeping them out of sight as much as possible. The switch (d) is concealed by a pad or drape of some kind thrown over the back of the chair, as aforementioned and the chair is ready for the first victim. When said victim leans back against the switch (d), closing the battery circuit with the coil (c), the *fireworks* begin. The coil may be a ¼ to ½-inch spark coil, and it is well to cover over the bottom and legs of the chair with cloth, etc. Contributed by C. F. CONANT.

RECIPES FOR ERASING FLUID AND CLEANING FILES.

For obliterating ordinary script, prepare a solution of chlorine gas in water. Take a freshly written copy and wash repeatedly with this solution and then with some lime water. This will neutralize any acid which may be left.

The following suggestion may be useful to those making use of steel files:

Thoroughly clean the file from any grease, oil, alkali, soda or potash and dip it into a solution of 1 part nitric acid, 3 parts sulphuric acid, 7 parts water, by weight, for from five seconds to five minutes. Then wash in hot water; dip in lime water and oil to prevent rusting.

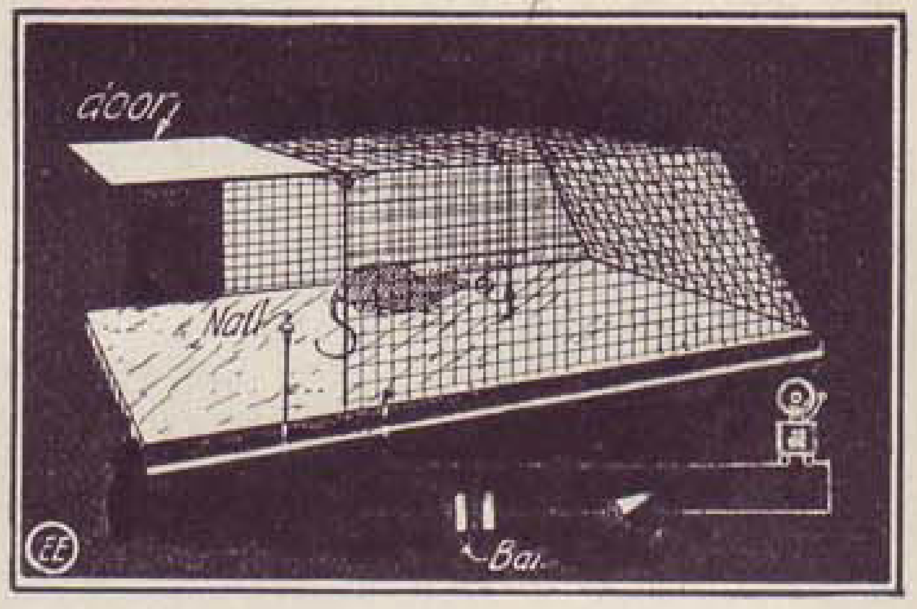
Contributed by G. J. ENGLESTEAD.

THIRD PRIZE $1.00.

AN ELECTRIC MOUSE TRAP ALARM.

The diagram herewith given depicts a novel little *mouse trap alarm* attachment.

Near the "trap" door is driven a nail so that when the door of the trap shuts it will touch the nail firmly. Two wires are fastened, one on the nail and the other to the trap, and connected up, as shown in diagram. When Mr. Mouse enters and attacks the cheese, the door closes, which causes the current to flow and rings the bell.



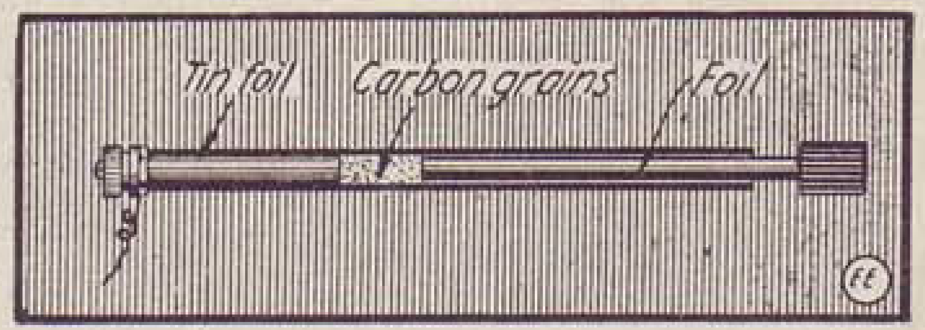
Mouse Trap Alarm.

Of course this alarm is not always necessary, but those wishing a mouse trap alarm for traps located at a distance will find this most useful.

Contributed by BERNARD COHEN.

A POCKET-SIZE BATTERY RHEOSTAT.

A pocket regulator for battery currents is made from a piece of small glass tubing, carbon grains, a match, tinfoil and a knob.



Simple Pocket Size Rheostat.

The match is fastened into the knob and covered with tinfoil, so that it will slide loosely in the tube. Stop the other end with tinfoil and fill in the ⅛-inch space with carbon grains. To regulate this move the match in and out.

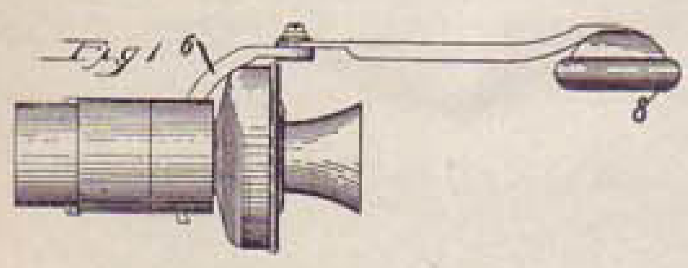
Contributed by J. H. WILSON.

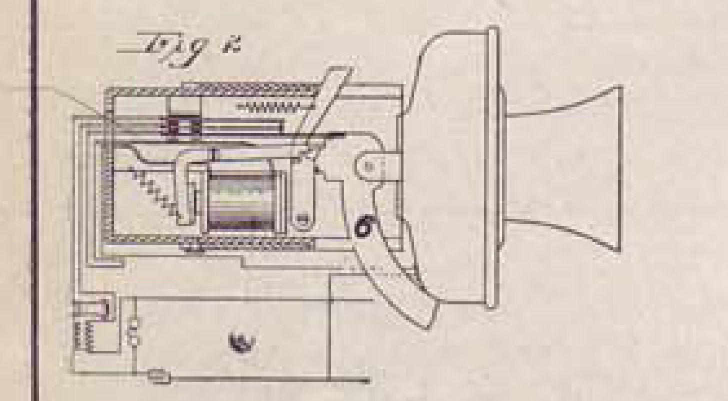
LATEST PATENTS

Automatic Telephone Switch.

(No. 1,145,632; issued to William C. Ude.)

An automatic telephone switch, so designed that the pressure of the ear against, say a watch case receiver 8, on a pivoted arm 6, will cause the switch springs, as perceived, to automatically control the cutting in and out of circuit of the telephone transmitter and receiver, instead of having to hang up tne receiver in the usual way. A very good idea.

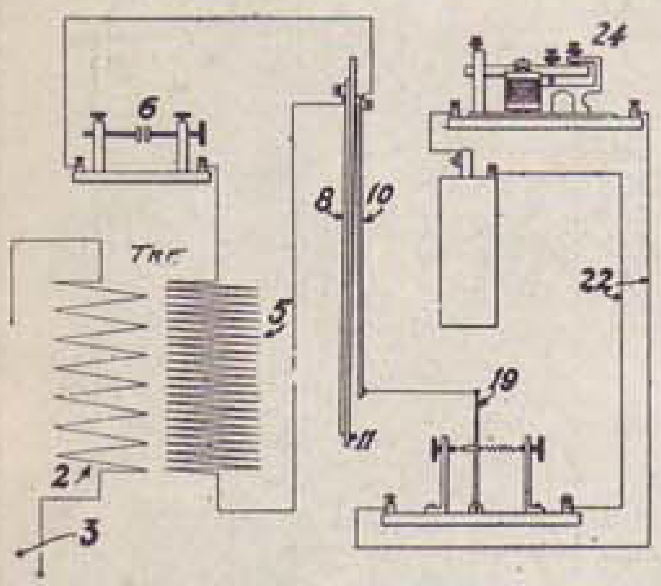




Wireless Receiver for Lighting Circuits.

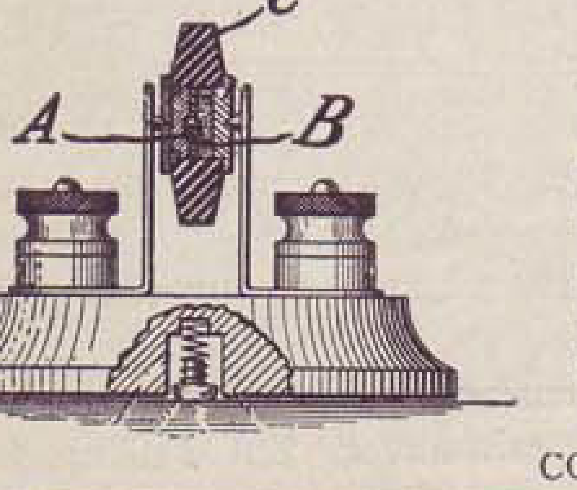
No. 1,143,799; issued to Ross B. Avery.)

An ingenious wireless receptor, claimed to work on lighting lines by its inventor. The wires 3, connect with an ordinary alternating current lighting or power circuit. The current passes through primary 2 and secondary 5 of a step-up, high-potential transformer. The current from the secondary transverses the small spark gap 6 and charges an electro-static plate arrangement 8 and 10, separated by an insulating plate 11. Whenever a sufficient charge acts between the plates 8 and 10, the plate 10 is attracted and in its movement actuates a switch 19, which in turn closes a local sounder circuit 22. It is claimed by the inventor that this arrangement will work on A. C. circuits and in adjusting the device the spark gap 6, is so regulated that the ordinary current from the secondary 5 will not jump the gap. Then when any wireless waves superimpose on the A. C. circuit and reach the apparatus, they will boost the current sufficiently to jump the gap and thus actuate the sounder 24, as evident from the foregoing.



Improved Mineral Detector.

(No. 1,144,399; issued to Eugene T. Turney.)

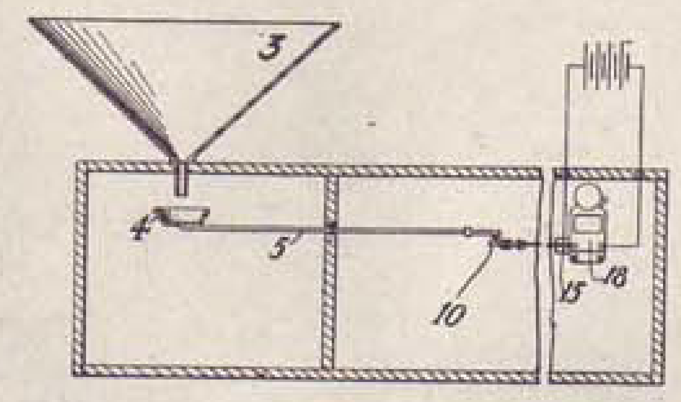


The well-known "Crystaloi" detector now for sale on the market for some time. It employs two electrodes A and B; the former having a piece of sensitive mineral, such as the best grade natural galena. The electrode B consists of a mass of finely divided conductive material, such as aluminum-bronze filings or they may be carbon grains, etc. These mineral electrode members are carried in a rotatable casing C; so that the detector is quickly readjusted, by simply turning the container on its axis, between two supporting springs, as perceived. Thus, a number of sensitive contact points are practically always available with this ingenious form of detector construction.

Electric Rain Signal.

(No. 1,143,246; issued to Joseph J. Barrash.)

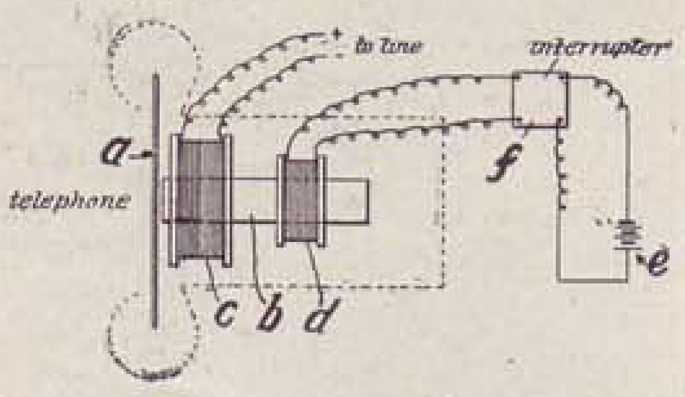
A useful device where a rain signal is desirable. The rain is caught by the funnel 3 and passes through it into a catch pan 4, which overbalances the pivoted lever 5. When rain falls and actuates the lever, it releases a sliding catch 10, connected by a spring or otherwise to a spring switch 15, which closes the battery circuit for an electric alarm bell 18 or instead, this circuit may control an electric motor for closing windows or skylights.



Sound Enunciator.

(No. 1,145,554; issued to Francis W. H. Clay.)

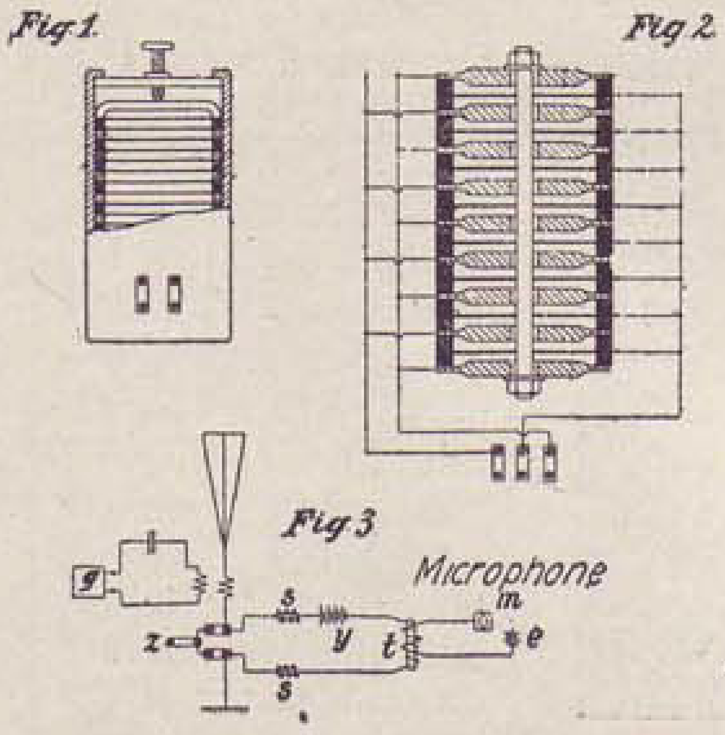
The inventor of this sound enunciator arranges to have the diaphragm A kept in a constant state of high frequency vibration by using for instance, a superimposing magnetising coil D, containing in its exciting circuit a source of electric current E, and a very high-speed interrupter F. It is claimed that if the diaphragm A is thus maintained in a constant state of vibration, at a frequency above audibility, that the ordinary sound waves to be reproduced by the diaphragm from the telephone line coil C, in the usual way, will be much clearer and freer from distortion or false tones than in the usual way, where the diaphragm is allowed to vibrate by itself.



Condenser Transmitter for Radiotelephony.

(No. 1,148,827; issued to Walther Burstyn.)

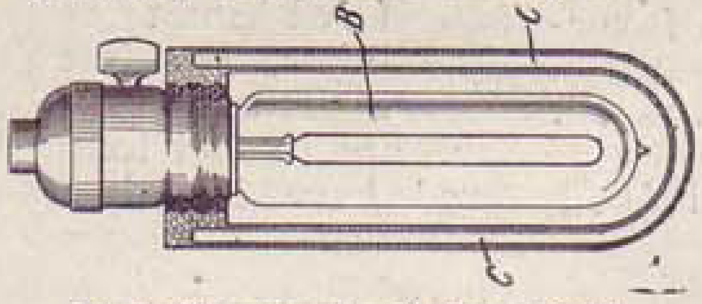
A modification of the condenser transmitter, at one time used by Prof. Fessenden for radiotelephonic antenna current control. This patent covers a multiple disc condenser transmitter, as drawing shows. The dielectric spaces between the various metallic discs are varied and conjointly the electrical condenser capacity, by creating various degrees of electric charge on the plates, through a circuit SYT, made up of a battery, choke coils S S, and telephone induction coil T. The primary of this induction coil is hooked up with a microphone of the usual pattern M, and a battery E. The regular high frequency radiophonic current charges the antenna through an oscillation transformer and the high frequency generator G. The condenser transmitter is shown at Z.



Heat-Shield for Incandescent Lamps.

(No. 1,145,837; issued to Edward Redmond Hoff.)

This invention relates to the provision of a glass vacuum chamber C around the regular incandescent lamp B′. The idea is to prevent excessive heat being projected from the lamp, especially when used in close proximity to a person reading, etc.

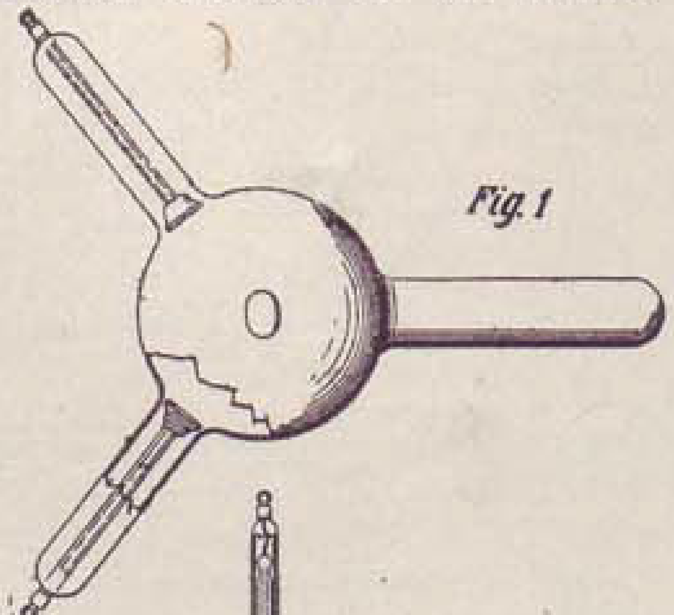


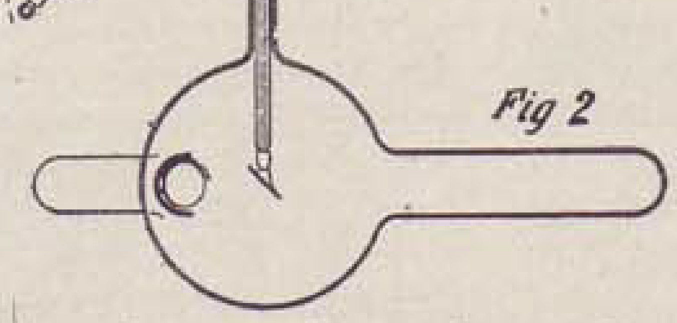
High-Frequency X-Ray Bulb.

(No. 1,147,125; issued to James E. Seeley).

This invention relates to a double cathode X-ray tube for use with alternating currents, irrespective of their method of production and especially with alternating high frequency currents.

The present invention consists fundamentally in the combination of a pair of cathodes and a single target, in such arrangement that both cathodes may focus on and bombard the target at a single focus point. This invention is effected by an arrangement of both cathodes on the same side of the plane of the impact face of the target; and the arrangement necessitates relatively angular positions of the cathode axes, these axes intersecting at the point of impact on the target, and also practically necessitates the placement of the target at an angle with the plane determined by the cathode axes. These features and others of more minor importance, accomplish the fundamental object of the invention; that object being to provide a tube capable of operating with alternating currents and having a single focus point on the target.

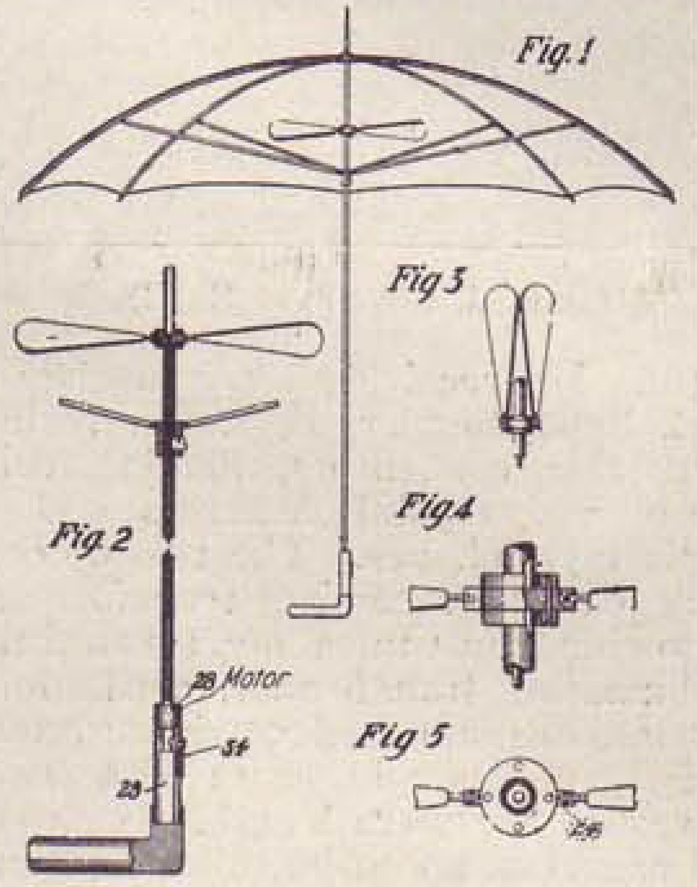




Electrical Umbrella Fan.

(No. 1,148,332; issued to Sylvester Onyskow, assignor one-half to Lubomir Dulikrovich.)

This invention covers the use of a small, electrically driven fan, as perceived and to be utilized in umbrellas. The fan blades are driven by a small shaft, passing upward through the umbrella handle and stem, as is evident. This shaft connects with a miniature electric motor 28, which receives current from a small flashlight type battery 29, in the handle of the umbrella. A push button 34 controls the battery current to the motor. The expense in making up this arrangement and also considering the gross efficiency, and especially the small "breeze producing power" in this case, does not seem to warrant at all the expense in making up such an arrangement.



Electrical Insulator.

(No. 1,146,201; issued to Silvester Nunn.)

Fig. 1

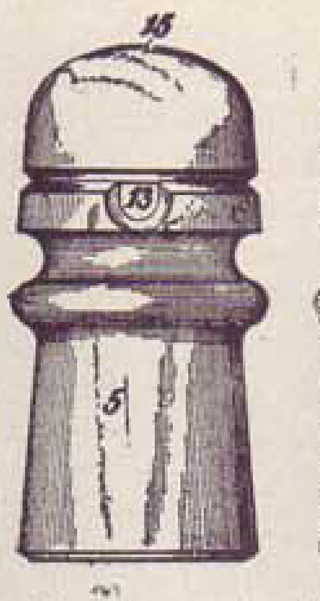
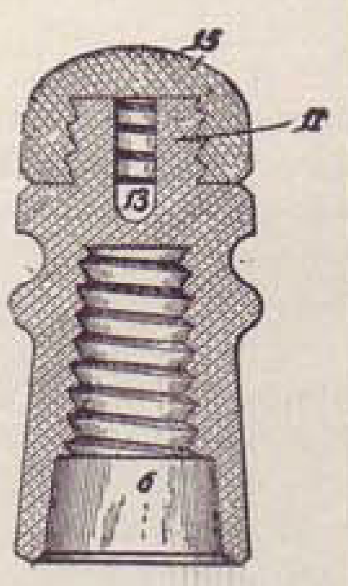


Fig. 2.



A new and simple form of insulator, intended to be made up of porcelain or glass. This insulator, so the inventor claims, is very efficacious for telegraph and telephone lines, especially; and the wire is not clamped in same, but is simply retained in the insulator in the slot 13. A threaded cap 15 screws down on a stud 11, forming part of the insulator base 5. Thus the wire once placed in the slot 13 cannot get out of same. The patentee claims that a long length of wire (even a mile or more) can be tightened up without touching any of the individual insulators along the line, due to this novel construction.

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You'll have to work for low wages all your life if you depend upon your hands to make your living. To earn more money you've got to learn how to work with your *head*—you must have *special training* for some particular line of work.

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If you want to advance in your present occupation, the I. C. S. can train you for promotion. If your present work is not pleasant, the I. C. S. can qualify you for a good position in the kind of work you like best.

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☐ Motor Boat Running
☐ Electrical Engin'er'g
☐ Electric Lighting
☐ Electric Railways
☐ Dynamo Running
☐ Teleр. & Teleg. Eng.
☐ Mechanical Eng'r'g
☐ Mechanical Drafting
☐ Shop Practice
☐ Steam Engineering
☐ Mine Fore. & Supt.
☐ Chemistry
☐ Stenog. &Typewrit'g
☐ Bookkeeping
☐ R. R. Accounting
☐ Good English for Ev'yone
☐ Civil Service
☐ Architecture
☐ Contracting & Build.
☐ Structural Engin'g
☐ Plumb'g & Heat'g
☐ Civil Engineering
☐ Salesmanship
☐ Advertising
☐ Agriculture

Name ____________

Street and No. ____________

City ____________ State ____________

Present Occupation ____________

USE OF TWO LOOSE COUPLERS.

(342) George Meister, Newark, N. J., asks for hook-up for two loose couplers in a radio receiving station.

A. 1. Diagram is given herewith for connection of two loose couplers, with the other usual instruments. In this way the second loose coupler serves as a duplex loading coil in both primary and secondary of the second coupler with a wide range of coupling.

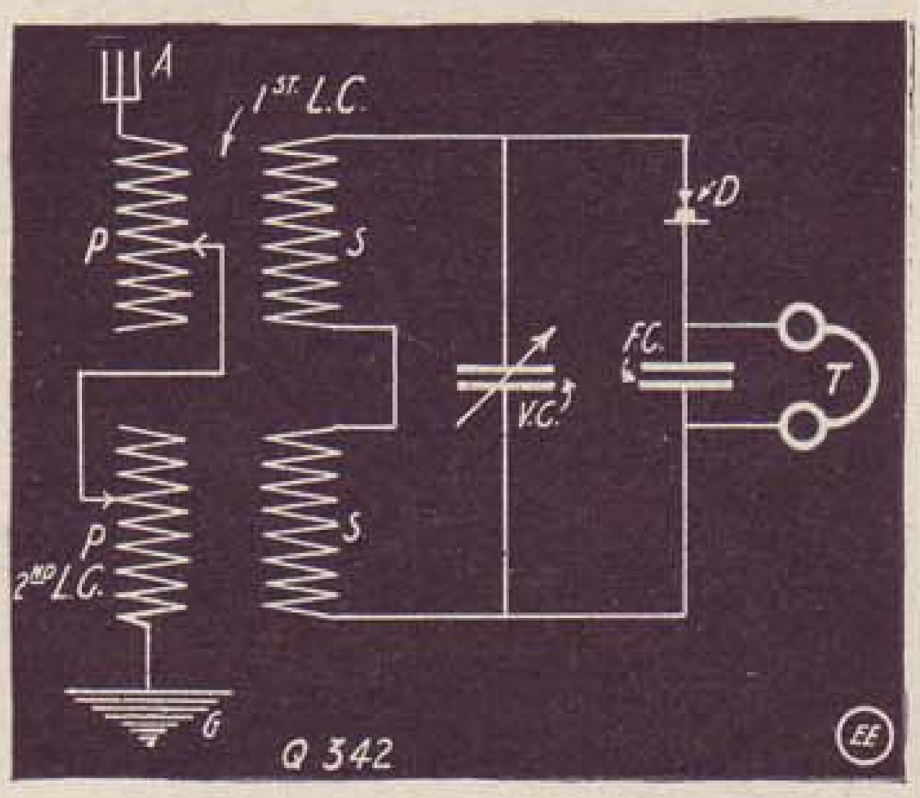

Diagram for Two Loose-Couplers.

TESLA COILS FOR RADIO WORK.

(343) Fred Kessler, Springfield, Ill., speaks of using a Tesla high-frequency coil for radio-telegraphic sending circuits.

A. 1. This is not practical and it is never employed when the usual form of Tesla coil is considered. Of course, every wireless transmitting set constitutes a special form of high-frequency Tesla or Oudin coil, but the ratios of the primary and secondary windings of these wireless high-frequency coils is many times lower than those existing in regular Tesla transformers used for demonstration and experimental work.

A. 2. The matter of aerial wave lengths was covered completely in an exhaustive article which appeared in the February, 1915, issue of *The Electrical Experimenter.* Copy of same may be procured from the publishers, prepaid, for 10 cents.

Roughly, it is: The wave length is equal to four and a half times the length in meters of the aerial wire plus the length of lead-in and ground wires.

RAISING DYNAMO POTENTIALS.

(344) William L. Crawford, Lima, O., wishes to know if he can procure a transformer to raise the voltage of his type "SS" 6-volt, 4-ampere direct-current dynamo, and thereby the output also.

A. 1. We do not know of any transforming device of the nature you mention for increasing the voltage developed by a dynamo such as the Knapp type "SS" machine.

You would not gain anything by such a transformation or boosting of the voltage, as of course the net energy will be reduced by such a transformation, as no machine operates at perfect efficiency. If you rewind the dynamo to give a higher voltage then the amperage will be less than it originally was. The watts (volts × amperes) will be roughly the same.

STORMS TIE UP WIRELESS.

Because of equinoctial storms, the Atlantic Communication Co., which maintains the wireless station at Sayville, L. I., has announced that until further notice it will be unable to accept any private messages to Nauen, near Berlin.

Price $100

The Royal

is the typewriter with the rapid-fire action and adjustable *personal* touch—the machine that fires letters as an automatic gun spits bullets!

Built for the Expert Typist—Better for the Ordinary Operator

The new Royal way of sending *direct force* from the fingertips to the type takes the "grind" out of typewriting and increases the daily output of any stenographer.

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Send for the "Royal man" and ask for a DEMONSTRATION. Or write us direct for our new brochure, *"Better Service,"* and a beautiful Color-Photograph of the *New Royal Master-Model 10.*

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NEW YORK

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Drawers are dust-tight and roll on Roller Bearings. Self-locking follow blocks hold contents vertically.

Each frame joint interlocked, glued and screwed together. Almost wear-proof. Was $13.25, ... NOW $12 Freight paid; see note. Three drawers, $10.00; two drawers, $7.75; see note Handsomely finished, Golden, Natural or Weathered. Birch Mahogany slightly higher.

Note Freight paid on orders of $10 or more to railway stations in Eastern and Central States. Consistent prices in West and South.

Free "Filing Suggestions"—helpful booklet, solves filing problems. With 96-page catalog "F" of Office Supplies. Catalog "H"—two lines Sectional Bookcases and Sectional Music Room Furniture.

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Weis Swinging Desk Stand For typewriter, adding machine, reference books, etc. Fastens to either side of any desk. Swings away when not in use. Locks where you want it. Oak top 14x18 in. on strong, black enameled metal support. Will not collapse or vibrate. Get one for your desk. See your dealer or write

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IF THE ELECTRICAL EXPERIMENTER is good reading once in a while, it is better when read regularly. To make sure that you get your copy, you should subscribe. There's a convenient coupon and a wonderful offer on page 301

Scientific Exchange Columns

UNDOUBTEDLY you have at the present time some things for which you have no further use. Do you wish to sell these things or exchange them for something, for which you have immediate use? There is no surer and quicker way to do this than by advertising your articles in these columns. The **Very** people, the **Only** people, who could possibly have a use for your things read this journal. More than 30,000 interested people will see your ad. It is furthermore the cheapest advertising medium for you in the country. Dealers' advertising accepted in Opportunity Exchange Columns only.

The rates are: One cent per word (name and address to be counted) minimum space 3 lines. Count about 7 words to the line. **Remittance must accompany all orders.**

We reserve to ourselves the right to refuse any advertisement which we consider misleading or objectionable. Advertisements for the November issue should reach us not later than October 5th.

The Classified Columns of "The Electrical Experimenter" Bring Positive Results.

TO SELL — One telescope, 3 feet long, special lens, good condition. Premo camera, pictures 2½x 3 in.; guaranteed; cost $1.50. Both for $1.55 prepaid. Richard Gaillard, 1719 Pendleton St., Columbia, S. C.

I WILL TRADE a complete wireless set, consisting of the following articles for an Indian or Harley Davison motorcycle of late model and in good condition: Loading coil, receiving transformer, 3 detectors, potentiometer fixed condenser, 2 variable condensers, spark coil, gap key, magneto, Holtzer-Cabot receivers, telegraph key and sounder and a 32-cal. revolver. Address Herbert Ewing, Point Marion, Pa. Box No. 62.

HAVE complete wireless set, racing bicycle, miscellaneous electrical goods, two revolvers. Want motorcycle, or make offer. Will also sell separately. All correspondence answered. Maurice Gelb, 74 East 116th St., New York City.

FOR SALE—Wireless outfit. Has single slide tuner, electrolytic detector, peroxide detector, condenser, two-point detector switch, potentiometer. Mounted and connected. Price, $6, or will sell parts separately. Box 84, Newburyport, Mass.

WILL EXCHANGE—$5 Seneca plate camera for spark coil or dynamo. Write to Elmer Dries, 205 S. Market St., Shamokin, Pa.

OLD jump spark coil, telephone generator and receiver, home-made tuning coil, Popular Mechanics 1913, lithograph locomotive model. Will sell or exchange for wireless goods. Ralph L. Kunan, Sabula, Iowa.

FOR SALE OR EXCHANGE—New $7 electric microscope, projector; guaranteed; ¾-inch coil, wireless key, loading coil with switches; $3 Murdock variable, spark gaps, powerful battery motor, excellent portable receiving set, stamp collection 1,000 rare varieties. Want Brandes Transatlantic phones and wireless apparatus. Write D. Goodman, 118 Seventh Ave., McKeesport, Pa.

WILL EXCHANGE—A 1-K.W. closed-core, high voltage transformer and cash for a Type "D" receiving transformer, De Luxe or Blitzen tuner. All correspondence or propositions answered immediately. John B. Hawley, Jr., 912 College Ave., Fort Worth, Tex.

WILL SELL—3,000-meter mahogany, factory-made loose coupler, new type S Dynamo-Motor cheap; Gravity cells, variable condenser printing press motors; can use spark coil. Write anyway. Carl Barnekol, 2317 Milwaukee Ave., Chicago, Ill.

FOR SALE OR EXCHANGE—$45 E. I. wireless goods, shotgun, 8-volt dynamo, 400 exposure kodak, Oliver typewriter, Electric vacuum cleaner, 8-inch fan, Moving picture camera and outfit. Verner Hicks, Marion, Ill.

FOR SALE—$17 takes Blitzen receiving set in perfect condition, without phones. If interested write Chester Fuss, Little Valley, N. Y.

FOR SALE—Fleming valve detector, new, $3, cost $6; 1-inch Bulldog coil, with extra large platinum points, $2.50; No. 9260 Sending condenser, $1.50; Polarized relay, 50 ohms, $2.50. Everything good as new. Max Kuhne, 94 River St., Hoboken, N. J.

FOR SALE—¼-inch Spark Coil, $1.35, postpaid; Spaulding single end punching bag cover, 50c.;; both good condition. Paul S. Potter, Riceville, Iowa.

WILL EXCHANGE—New three slider Tuning Coil, 8 x 12 inches, tested for Arlington, for services any live boy can render. For Sale, slightly used ½-kilowatt "Blitzen" transformer. Lloyd Gress, Pitman, N. J.

WHAT have you to trade? Join my Bureau of Trades. Have over 500 members; trades arranged anywhere. Send for full particulars. 3820 Lee Ave., St. Louis, Mo.

TYPEWRITER—Cost $100. Good as new. Will exchange for $18 Camera, Electrical goods, Books, Mail-order Goods, Musical Instruments, Athletic goods, Bicycle, Automobile Accessories; $18 Cash, or Offer. What have you? Write. Particulars FREE. H. Victor King, Box 3461, Boston, Mass.

FOR SALE—Clapp Eastham Ferron Detector, $5; Manhattan tubular condenser, $3.50; Brownie No. 2 Camera, $2, or what am I offered? Wm. Matthews, care Walbridge & Co., Buffalo, N. Y.

FOR SALE — $15.00 Murdock loose coupler, primary rewound with 140 turns and tapped to two ten-point switches on hard rubber plate. Worth $20; will sell for $10. Murdock tuning coil rewound as 2,000 meter loader with nine-point switch, sliders removed; $2.50; $18 case of Dietzgen drafting instruments; good as new; $7.50. Edwin L. Powell, 1206 E. Capitol, Washington, D. C.

EXCHANGE—One complete wireless receiving outfit. Want canoe or gasoline engine; prefer motorcycle engine, or what have you? All letters answered. Randall O'Brien, Louisiana, Mo.

FOR SALE — Brand new wireless outfit instruments; never used. For particulars, write L. J. Becker, P. O. Box 339, Galveston, Tex.

WANTED—E. I. Co.'s ½ K.W. transformer coil No. 8060. Must be in good condition. Write. Lloyd Copp, Center, Ind.

HAVE $9 worth of American model builder. Would like good loose coupler, or what have you? William Collins, Gran Ville, Mich.

FOR SALE—X-Ray tube in good condition; dia., 4 inches; will sell for $2.75 prepaid; also step-down transformer, $3 prepaid. Write C. A. Barley, 708 Dolphin St., Baltimore, Md.

FOR SALE—Name plates, battery, shunt, phones, aerial, ground, on, off; 2c. a piece. Henry G. Aschbrenner, 7617 Carpenter St., Chicago, Ill.

WOULD like to purchase, second-hand, a Ritchie induction coil; 4 in. or 5 in. spark; good condition. Apt. 9, 2103 N St., N. W., Washington, D. C.

FOR SALE—1,200 meter, loose coupler, $2.25; ½-inch coil, $1.50; fixed condenser, 25c.; plate condenser, 35c.; upright detector, 60c.; Simplex typewriter, 60c. C. Stanley, 405 Jersey St., Buffalo, N. Y.

FIRST REMITTANCE of $1 gets a coherer and decoherer complete; never used; postpaid. Instrument worth $2 when new. Wm. D. Wagner, 123 W. 4th St., Duluth, Minn.

WILL EXCHANGE—A 6-volt, 80-ampere Williard storage battery for polarized relay or phonograph, or what have you? Samuel Cohen, 1936 Pitkin Ave., Brooklyn, N. Y.

FOR SALE—A Baker electric coupe in first-class condition with new batteries; three passenger. On account of illness of owner, will sell at bargain price of $500; cost new, $3,200. S. Gernsback, 817 West End Ave., New York City.

WANTED—One Bulldog 1 inch or 1½-inch Spark Coil. I. Wiley, 1214 E. Madison St., Portland, Ore.

FOR SALE—Resonator, 75c.; Potentiometer, 75c.; Helix, 75c.; Variable Fixed Condenser, 75c.; Fixed Condenser, 25c.; Galena Detector, 50c. Leighton Gilbert, Bristol, N. Y.

FOR SALE—A complete wireless sending and receiving outfit. Cost me $40. Will send for $20. For complete list of instruments send to following address: Horace Hinz, 327 Old Bergen Road, Jersey City, N. J.

FOR TRADE OR SALE—Good D. C. Fan, fourth K. W. Transformer, fine Alto Saxophone, Revolver, etc. Will trade some of these for a good Microscope. Also want Camera, Storage Battery Motor, X-Ray Outfit, etc. Send your list and make offers. L. Smith, Oak St., Ashland, Ore.

BARGAIN—Daily Life of a Railway Mail Clerk, Modern Business Penmanship, New Commercial Arithmetic, Civil Service Manuals 1, 2 and 3. $3 takes entire lot. Mark Kistler, Centreport, Pa.

FOR SALE—1 De Forest Audion Detector (with new bulb and batteries), $15; an E. I. Co. 5,000-meter loading coil, $1.50; Fixed variable condenser, $1; oscillation transformer, $5; a pair of 3,000-ohm "Government" phones, $5; Variable condenser, $2; a Bunnell Mascot Rotary variable condenser, $6; a 5,000-meter navy type loose Coupler, $5. These instruments are in first-class condition. Other apparatus on application. If interested write George D. Todd, Jr., New Albany, Ind.

HAVE one 110-volt D. C. Fan Motor, one A. C. 110-volt, 125-cycle "Emerson" Fan Motor, one Volume of "Practical Electricity and Engineering" and four volumes "Electrical Review and Western Electrician" and some cash. Will exchange for any first-class wireless apparatus; want phones and Audion Detector. What have you? John Kidd, 121 Leslie Ave., Niles, Ohio.

READERS — I want the following magazines: Popular Electrics, 1908, from beginning to September, 1909; January Bubiers Nat. Electrician, 1903; June Elec. & Mechs., 1908; January, 1909; April, 1911; October, 1912; August Elec. Experimenter; 1913, January to April; 1914, January and April. For these will give 40 Elec. Mag., 2,000-ohm headset, or cash. Harold E. Hickey, 1435 Howard St., Philadelphia, Pa.

NAVY Type Loose Coupler; new; $8. Also complete portable set. What have you to exchange? Hathaway, 856 Fulton St., Brooklyn, N. Y.

FOR SALE OR EXCHANGE—Westinghouse step-down transformer, type A, 10-volt amperes, 60 to 133 cycles; in A1 condition. Will exchange for Type O Crystaloi, or 2-inch coil. W. Beattie, 517½ Chestnut St., Lebanon, Pa.

FOR SALE—Two good electric motors in first-class condition; 1-12 horsepower, $5; 1-6 horsepower, $8; 800 feet of good comedy moving picture film, $4. H. David, 711 S. Kedzie Ave., Chicago, Ill.

I WILL EXCHANGE a high-grade cornet for a half or quarter K.W. wireless transformer. Have a lot of copper ribbon for sending transformers. Will sell it out at 3 cents per foot. Henry Graves, Jr., Geneva, N. Y.

SALE OR EXCHANGE—One Weeden toy motor; 1-20 ohm sounder; 2-50 ohm relays; 1 small Leyden jar; 1 D.P.S.T. switch; 1 voltmeter; 1 telephone transmitter. Alexander V. Bollerer, 77 Linwood St., New Britain, Conn.

WILL SWAP electrical chemistry and books on physics for anything useful. Henry Priebe, Kent, Ohio.

WANTED — One-inch spark coil and gap; good condition. Have electric engine and car, 80 feet track; one railway switch; same as new; value, $9. L. D. Smith, 28 Poinier St., Newark, N. J.

EXCHANGE — A Gem adding machine in good working condition; cost $10. Want a pair Brandes Transatlantic phones or a good 110-volt Universal motor speed range from 3,000 to 8,000 r.p.m. with load. O. W. Nelson, 4333 Elm St., Calumet, Mich.

FOR SALE—Two one-inch coils, $2.50 each; two small motors, 50c. each; quarter-inch coil, 75c. Moershfelder, 34 Ketchum Pl., Buffalo, N. Y.

FOR SALE—Four H.P. Excelsior motor cycle engine with carb., $15; 4 H.P., 2 cycle, 3 port engine; use as stationary, marine or portable, with carb. coil-less oil cups; used very little; $25; one set cycle car wheels, axles, tires and tubes, set of steel castings for four cantilever Krupp springs, $60. For further description, E. W. Jenny, 3821 W. 34th St., Cleveland, Ohio.

FOR SALE—Complete Wireless Outfit. Consists of double slide tuner, condenser, potentiometer, detector, buzzer, 1,000-ohm receiver, 1½-inch coil, fluted zinc gaps, helix, condenser and key. All mounted on suitable base. No home-made instruments. $6. Portable receiving set, consists of loose coupler, galena detector, condenser; all in good case, $2.50. Motors, telephones, cameras, aerial and magnet wire. Write for particulars or send money. Everything guaranteed. Paul Woodward, Rodney, Iowa.

WANTED—2,000-ohm headset, or one good loose coupler. Have relay marked 200 ohms and sounder marked 20 ohms. Will trade for any of the above, or will sell cheap. Wilber E. Dittemore, Redmond, Ore.

SALE OR EXCHANGE—Complete wireless set, consisting of 1-inch coil, helix, gap, condenser, key, aerial switch, double slide tuner, galena detector, receiving condenser, single headset, Brandes 1,000-ohm receivers, binding posts. Will either sell or exchange for Audion or Variable condensers. Jeter Pinkston, Valdosta, Ga.

EXCHANGE—Murdock Tuner, variable, cash for ½ K. W. condenser; also other apparatus to exchange for good transformer. Give description to Arthur Sacka, 2670 E. 40th St., Cleveland, Ohio.

FOR SALE—Large Electro tuner, $1.75; variometer, 50c.; 11-plate variable condenser, 75c.; 9-volt rotary gap (8 electrodes), $2.50. All instruments in excellent condition. Stuart W. Pierson, Carrollton, Ill.

"HYTONE"—½ K. W. set for sale; condition excellent, price very reasonable. This apparatus, operating station 1HA, now 1ZW, has covered remarkable distances. Record, 650 miles. Come and inspect apparatus personally if possible; if not write for photo and description without delay. Have just installed more powerful set. Wm. H. Allison, Worcester, Mass.

A COMBINATION 4 x 5 or 5 x 8 Plate Camera (Tripod, one French and one Morrison Wide Angle Lens (each cost $25), Plate Holders, carrying cases, etc.; a bargain. W. E. Day, Pittsfield, Mass.

I HAVE 3 transmitters, 2 ringing boxes, 2 telephone receivers, 1 desk telephone, 1 Edison Primary battery, 1 telephone generator worth $25. Will swap for wireless set or apparatus. R. C. Bayley, 16 Main St., Plymouth, N. H.

FOR SALE—Set Ives Electric Train, 3 pieces; 8 Curve, 10 Straight, Third Rail Track, practically new, worth $6, will sell for $3.50. H. Ananiantz, 700 West Washington, Los Angeles, Cal.

WANTED—A 2,000-ohm double headset, each receiver 2,000 ohms. R. B. Watt, Box 1, Stapleton, N. Y.

FOR SALE OR EXCHANGE—Rotary Spark gap to work on dry batteries, Geissler tube, Harper's Aircraft Book, Spark gap, set of Meccano No. 3, Carl Sceternfeld, 305 Lexington Ave., New York.

FOR SALE—Omnigraph Dunduplex transmitter, sounders, relays, keys, aerial insulators, small motor, tape transmitter and wireless goods. Write for list. John L. Bowman, Reinholds, Pa.

FOR SALE—$14 electric railway, $5; $2 omnigraph, $1; $6 worth Magic, $3.50; two $2 stamp albums, $1 each. For particulars write Franklyn Stratford, Bentley Ave., Jersey City, N. J.

FOR SALE—2 Electrolytic Detectors (new), $1 each; 1 Three Slide Tuner, $2; 1 Toy Motor, 50c. All in perfect condition. Miles F. Ham, 21 Crosby St., Augusta, Me.

FOR SALE OR EXCHANGE—160 Watt set, value $15; 400 watt impregnated condenser, $8; Davis battery motor, $4; Stevens single-shot rifle, $7. Write for list. Money or transmitting apparatus wanted. Make offer. H. Smeltzer, Norwood, Mass.

ELECTRICAL—35 K.W. Westinghouse Alternator, right for a small town plant, $300 in payments of $20 per month. 18 K.W. 220 volt direct current generator will carry 900 regular 16 candle Tungsten lamps, $200 in payments of $15 per month. 16 cells storage battery in good condition $35. Electric Bath Cabinet $25. Box M, Troy, Ohio.

FOR SALE OR EXCHANGE—Stevens' "Favourite" 22 cal. rifle, value $3; will trade for Crystaloi or Radioson Detectors. Gartz Windenburgh, Lamont, Iowa.

EXCHANGE—Brass upright Microscope, $1.75; Kodak, Premo Jr. No. 1, 2¼ x 3¼, $1.80. Want Loose Coupler, not home-made. Porter Bennett, Mesquite, Tex.

FOR SALE—½-H. P., 110-volt A. C. motor, $27.50. Will buy or trade 2-inch coil. C. P. Kelley, Irving, Ill.

FOR SALE—4 x 5 print washer, used once; two 8 x 10 trays, dark room lamp, Drake's Multiple Picture attachment, size 4 x 5; acetylene bicycle lamp; Year 1913 Scientific American, Spaulding's Note, Speller. Write for description and prices. Donald L. Zook, Denver, Ind.

FOR SALE—First-class wireless set at moderate price. Write for particulars. Gogerty, 210 Reid Ave., Brooklyn, N. Y.

FIRST MONEY ORDER for $10 takes either my 16-V. dynamo or ¼-H. P., 110-V. D. C. Motor or 1-H. P. Gas Engine. Maurice Lane, Geneseo, Ill.

FOR SALE—One Electro Loading Coil, $1.75; one Electro Loose Coupler, $2.25; one No. 2 Brownie Camera, $1.60; all for $5. Merwin Finkelstein, 308 Eddy St., Ithaca, N. Y.

FOR EXCHANGE—Eastman folding kodak, Medical Coil, Stepdown Type "N" transformer, cost $4; Electro and Delta electric bicycle lamps, Book "Practical Electricity," cost $2; two electro magnets; all goods new; value $23. Exchange for good wireless receiving set. Write and tell what you have. Ray M. Casper, 621 E. Innis St., Salisbury, N. C.

EXCHANGE—Variable Condenser for Telegraph Instrument, Switch Block, Silicon Detector and Fixed Condenser for Telegraph Instrument; Murdock Spark Gap and Buzzer for same. Harold Bonney, 103 Spruce St., Pana, Ill.

EXCHANGE—Solar bicycle lamp, cost $2.50, for water motor, standard thread faucet. B. Bergman, 120 N. 109th St., Chicago, Ill.

FOR SALE OR EXCHANGE—Loose Coupler, tuners and other wireless apparatus; have a number of pieces. Make offer. William Lesky, 2800 Snyder Ave., Philadelphia, Pa.

FOR SALE—Entirely new pumping outfit, 1½ H. P. engine, 10-foot belt pumpjack, $26; good coaster brake bicycle, $9. Frank Fish, Geary, Okla. R 1.

FOR SALE OR EXCHANGE—One Spark Gap mounted on marble base, 50c.; one Cat Whisker Detector mounted on slate base, 60c. R. A. Clapp, Groton, N. Y.

FOR SALE OR EXCHANGE—One motor and bicycle. Write for particulars. Lloyd W. Cameron, West Collingswood, N. J.

FOR SALE OR EXCHANGE—Sending and Receiving set. All in good condition. Write for information. Anythony G. Jurincic, 9550 Commercial Ave., Chicago, Ill.

FOR SALE—3A Brownie Camera (post card size). It is brand new; has never been used. Price $9, if taken at once. E. Haugerud, Scappoose, Ore.

FOR SALE OR EXCHANGE—Chemical laboratory outfit, nearly 300 pieces; will sell whole or in part. 8 Vol. Cyclopedia, I. C. S. Text-books of Chemistry and Electrical Engineering. Also other books and articles. Sell cheap for cash. Will exchange for suitable articles of equal value. Complete lists exchanged. M. Wand, 118 Crane St., Schenectady, N. Y.

WANTED—Receiving and sending instruments. Transformers from 1-6 K .W. to 1 K. W., Variable condensers, etc. Have one set of six books of the Practical Reference Library (fine), Automobile course, rifle, relay, omnigraph, story books, camera, revolver, home-made voltmeter, ammeter, galvanometer, Wheatstone Bridge and old magazines. Walter Franseen, Woodhull, Ill.

WANTED—Crystoli detector and variable condenser by September 20 for portable set (2-switch navy type tuner, detector and condenser), moving picture machine (electric), value $4.50; ¼-inch spark coil, in excellent condition. Thomas Steringer, 260 Hudson St., New York.

FOR SALE—Duck's new 1915 Detector with silicon, 1 New Rotary Spark Gap; never been used. All for $5 cash. M. H. Chapman, Baldwinsville, N. Y.

HAVE ½-inch Coil, zinc Gap, strap key, 4-plate condenser. Trade for loose coupler or Brandes receiver and Double headband. Garwood, 84 King East, Toronto, Canada.

WANTED—To buy a few Geissler or vacuum tubes, also an X-Ray tube. Albin Lundquist, Cable, Wis.

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